THE IRON AGE

New York, April 18, 1918

STERLING MERIT IN DESIGN AND CONSTRUCTION

¶ If you have a metal cutting job, there is a HUNTER saw to do it quicker, better and more economically than any other saw.

¶ Ten to ninety inches in diameter.

¶ The design is right, the material is right and they do the work.

¶ Thousands of them are standing up under the most difficult service every day making records for themselves and reputations for us.

Hot Saws, Friction Discs, Solid Blades made from Vanadium, Tungsten and Chrome Alloy Steels.

Saw Sharpening Machines, Inserted Tooth Grinders. Hardened Steel Specialties, etc.

Write for prices.

HUNTER SAW & MACHINE CO.
PITTSBURGH, PA.

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AN EXAMPLE IN CONSERVATION

In good beehive practice, 1000 tons of Connellsville coal makes 630 tons of furnace and foundry coke—and nothing else but smoke and dirt.

To-day the KOPPERS OVEN plant of the Seaboard By-Product Coke Company at Jersey City, N. J., produces from every 1000 tons of coal—

660 tons of high grade furnace and foundry coke.

AND

50 tons of coke breeze, used as boiler fuel.
10,000 gallons coal tar for industrial uses.
2,000 gallons benzol for chemical uses and motor fuel.
400 gallons toluol for high explosives.
26,000 lbs. ammonium sulphate for fertilizer.
6,000,000 cu. ft. of coal gas for domestic uses.

The coking of 1000 tons of coal in by-product ovens produces an amount of surplus gas equal to that produced as water gas by 120 tons of coal and 24,000 gallons of gas oil; an amount of ammonium sulphate sufficient to fertilize 2000 acres of corn, wheat or cotton; sufficient toluol to produce 5200 lbs. of T.N.T., or enough for 8600—3″ shells; sufficient benzol to run a motor car 15,000 miles.

MAKE BY-PRODUCT COKE—USE BY-PRODUCT COKE

AND CONSERVE OUR COAL SUPPLY

H. KOPPERS COMPANY

Pittsburgh, Pa.

Builders of By-Product Coke Plants

THE IRON AGE

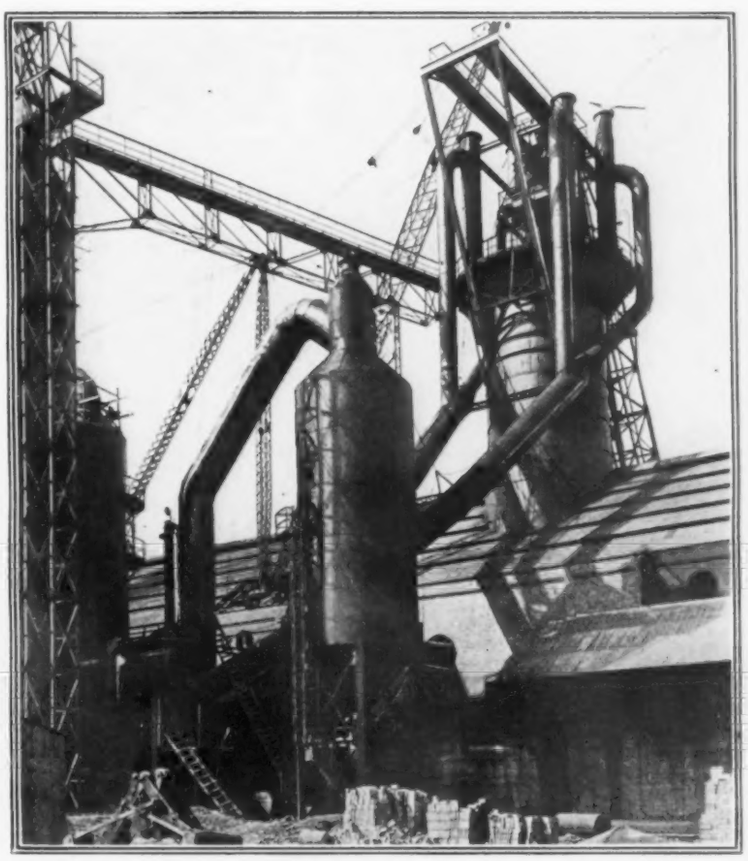
New York, April 18, 1918

ESTABLISHED 1855 VOL. 101: No. 16

Unique Feat in Blast Furnace Building

Within One Year 600-Ton Stack Is Completed —Tied to Existing Plant Without Halting Production—Details of Stoves and Valves

IN these days of embargoes, transportation difficulties and scarcity of labor and materials, the building and putting into blast within a period of twelve months of a blast furnace unit of the largest size, complete with ore, dock and ore-handling machinery, is an achievement which the owners, engineers and contractors may justifiably regard with pride. The new furnace was tied to an operating plant, though the latter accomplishment involved extensive changes in the existing boiler and power houses, blowing equipment, ore bins, electric transmission, water mains and sewers, and all was done without loss of production by the other furnaces of the group. For the erection of the furnace, which is No. 5 of the Iroquois Iron Co., South Chicago, Ill., Freyn & Co., Chicago, were the engineers. The accomplishment would be noteworthy in normal times, not only because of the magnitude of the undertaking, but also because of the expedition with which the work was carried on.



New Iroquois Furnace No. 5, Erected and Placed in Operation Within One Year Despite Difficulties That Exist To-day in Obtaining Labor and Material. To the extreme left is shown elevator structure for quick ascent to top of 100-ft. stoves

Early in 1917, the Iroquois company decided to add to its capacity at South Chicago and awarded the contract for building a 600-ton blast furnace to Freyn & Co. The new furnace has been built at the company's new plant, in line with two 400-ton furnaces built in 1911-1912. It was the expectation that the new stack would be in blast in time for the opening of lake navigation the following spring. Ground was broken March 12, 1917, and the furnace was blown in March 5, 1918, considerably ahead of scheduled time.

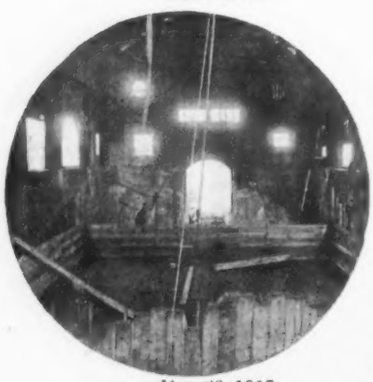
The new stack was located immediately adjoining No. 4 furnace, in the same cast house, which is of unusual length, but no longer used for its original purpose. The cast house roof, which was left intact so far as possible, afforded splendid protection for the work of excavating, pile driving and putting in the concrete foundation, allowing the work to proceed without interruption during winter weather. The excavation included the removal of some 1500 cu. yd. of reinforced concrete, this being accomplished in record time by the Iroquois Iron Co.'s own labor force. Otherwise excavating, piling and concrete work was done by the Great Lakes Dredge & Dock Co.

The new blast furnace is 92 ft. high from iron notch to top ring, with a bosh diameter of 22 ft. 6 in. and a hearth diameter of 18 ft. 6 in. The furnace has a cubical content of 25,500 cu. ft. from the bottom of the closed 13-ft. bell to the iron notch. There are ten cast-iron columns supporting a steel plate mantle and resting on a continuous cast-iron sub-base. The hearth jacket is of the cast-iron segmental pipe-cooled type, heavily banded. The tuyere breast consists of a solid armor of 1½-in. plates with openings for ten tuyeres. The bosh is of the banded type, with 8

March 13, 1917

March 21, 1917

May 24, 1917



May 29, 1917

June 12, 1917

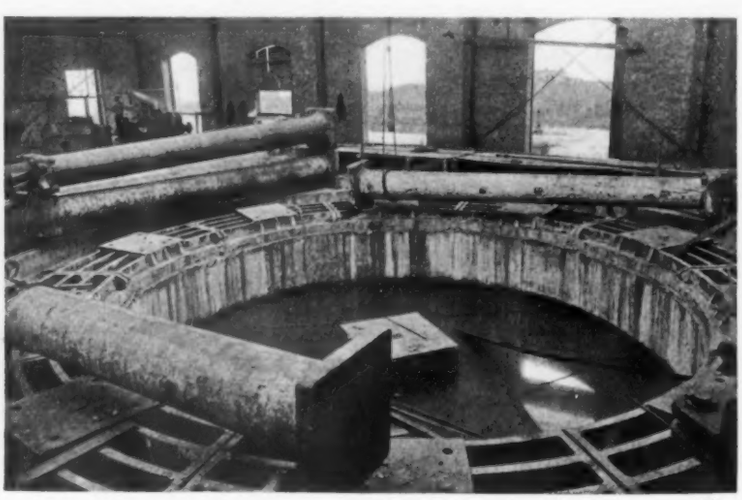
bands 1½ in. thick. The furnace shell is specially designed to meet modern furnace lines, increasing the thickness of brickwork where it is needed, and sparing it where too heavy brickwork is a detriment. The shell is surmounted by a Kennedy top dome of heavy construction integral with the shell. The stock line of the furnace is protected by wearing plates of white iron. The furnace top is of the Brassert type, dimensioned to decrease the production of flue dust, with receiving hopper and throat designed to give correct distribution, even when the charge is not revolved. The top allows adjustment and proper centering of both bells and hopper, thereby to insure uniform wear of the lining and regular performance of the furnace. To control the uniformity of distribution on the big bell, independent of the method of charging, the McKee revolving mechanism was installed in place of the stationary small bell.

The gas is taken off by four uptakes, two of which are equipped with Baer safety explosion valves. There are four downtakes, each two combining into one unlined downcomer. The two downcomers enter the dust catcher radially, and the gas, leaving the dust catcher, passes through a 15-ft. Brassert gas washer, then enters a 12-ft. dryer, clean dry gas being delivered to stoves and boilers.

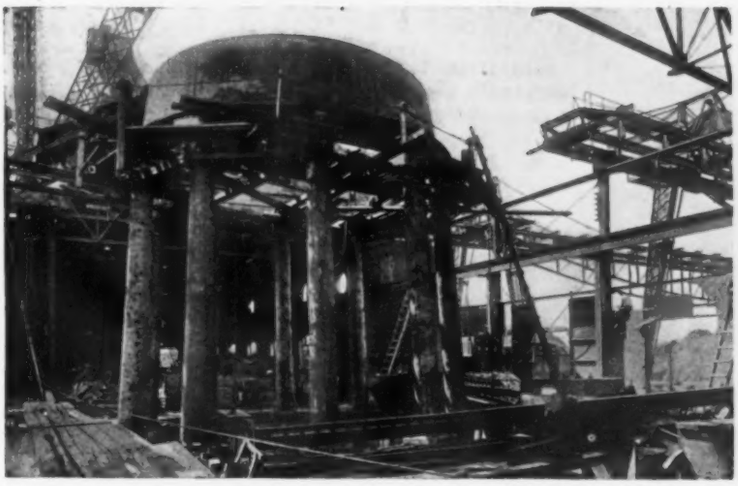
The washer embodies the standard Brassert principle of two-stage scrubbing, combining a first rough cleaning stage to eliminate the heavier portion of the dust and to effect primary cooling, followed by a second stage in the same tower to effect the fine cleaning. The dirty gas entering at the bottom meets a heavy spray from the hurdles above. Rough dust is precipitated and the gas is saturated with water vapor, which is condensed on its upward travel, entrapping fine dust and fume particles. The rough cleaning stage is arranged to give a combined rain and contact effect in cleaning and cooling the gas. Channeling and stratification is prevented by the spacing and arrangement of the superimposed hurdle elements, these also retarding the descent of water through the scrubber and giving an increased time element toward cleaning.

In the second stage, one of fine cleaning, the gas impinges at considerable velocity against three successive double rows of inclined baffles. These are set at an angle and with spacing to insure maximum impinging effect, and not cause backpressure. The effect of a dynamic or rotary washer is approximated at this stage. All of the water is added in the second stage through a special design of the spray nozzles in such a manner that the water and gas are forced into intimate contact as they impinge and travel through the baffles.

All of the water being added in the second stage, the counter-current effect is utilized to the fullest extent. The gas leaves the scrubber within a few degrees of the entering water temperature. Economy in operating and maintenance charges, together with economy in water consumption, and the requirement of minimum care have been demonstrated by ample experience. The only attention necessary is to maintain a supply of water that is approximately constant. With the water supply assured, the scrubber remains clean and no opening up or



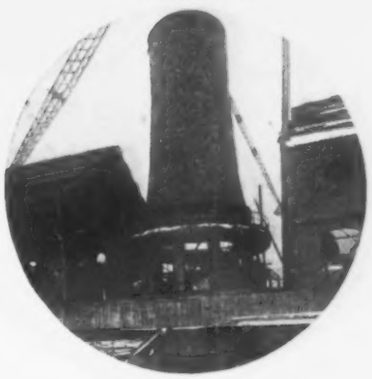
Aug. 10, 1917



Aug. 28, 1917

The Photographs on These Facing Pages Illustrate the Building of the Furnace. It will be noted that excavating was begun under the cast-house roof, and that the work was made more difficult by the necessity of removing a reinforced concrete tie-wall that extended across the floor area. The steam shovel was worked in comfort during cold and stormy weather. The steel-plate mantle was supported by ten cast-iron columns, resting on a continuous cast-iron base. After the furnace proper was under way a section of the building was removed, but later restored. To the end of the cast-house an addition was built. Snow covered the ground when the main construction work was finished.

Oct. 15, 1917



Oct. 30, 1917

Nov. 26, 1917

Jan. 23, 1918

Feb. 21, 1918

attention is required at any time during a blast campaign. There is no mechanism to require attention. The flexibility is found sufficient to handle heavy dust loads on a slipping furnace. Scrubbers of this type which have been in operation for a number of years have offered opportunity for inspection at the end of various furnace campaigns and they have invariably been found clean, it is stated, after years of service. Stoves using the gas from them have similarly been inspected, and have been found to have clean undisintegrated checker work and joints.

The stoves are three in number, 22 ft. in diameter and 100 ft. high, of 95,000 sq. ft. of heating surface each, or 285,000 sq. ft. in all. They are of the two-pass side combustion chamber type with checker openings 3½ in. square and 2-in. checker walls. The checker and arch design follows the Brassert-Jones patent, a construction which forces the equalization of flow of descending gas and ascending air through the checker openings, and is found effective in overcoming the tendency of gas and air to channel and to give hot and cold segments in the checker work. With three stoves to a furnace, this type of stove, it is claimed, will carry heats 1300 to 1400 deg. Fahr. on wind volumes in excess of 40,000 cu. ft. per min., with stack temperatures not in excess of 400 deg. Fahr. over the duration of a continuous furnace blast. Putting the plant on a three-stove basis results in a notable saving in stove equipment, including shell, lining, valves, castings and accessories, decreases radiation and leakage loss, and saves operating labor. The stoves are insulated with Sil-O-Cel brick and powder between brick lining and stove shell, the dome being insulated with Johns-Manville Vitro fire felt.

The engineers lay emphasis on the 30-in. Mathesius hot-blast gate valves with which the stoves are fitted, one being shown in the accompanying illustrations. The Mathesius valves were originally developed at the South Works of the Illinois Steel Co., where several have been in service without replacement for upward of three years. They differ radically from the mushroom type of valve, and it is asserted they eliminate to the maximum degree the numerous troubles to which hot-blast valves have been subject. The first point made by the builders and engineers is that the valve eliminates the usual double right-angle turn of blast travel, with the attendant difficult brickwork. It is designed to eliminate wind leakage, and the results have been successful, by a form of construction which maintains perfect alignment of valve seat and gate, through the use of a tapered gate swinging between parallel seats. The valve body is an annealed steel casting, while the gate and seats are made of bronze. The gate and seats are water-cooled. Water leakage between stems and valve is ob-

Progress in the Work of

Incidental to the work was the removal of the brick blacksmith shop, 30 x 40 ft., shown in the first picture. It stood in the way of the new stoves and was removed 300 ft. The third, fourth, fifth and sixth pictures are views looking away from the blast furnace site. With

March 25, 1917

April 24, 1917

May 29, 1917

July 3, 1917

viated by the elimination of all dropping or banging of the valve on the seat, and also because there is no binding of the valve gate on the stems. Two stems are used, interlocked by an external yoke. With the stove on blast, the gate of the valve is completely drawn from the path of the blast, making impossible the cutting of the face of the gate. Absence of wind leaks also eliminates cutting and cracking of the faces of the gate and seat by wire drawing. The withdrawal of the gate from the path of blast effects a saving in heat of the blast, tests having shown an increase in temperature of cooling water that is negligible as compared to the marked increase of temperature of cooling water through the mushroom-type valve. Before the valve is placed it can be inspected for closure and alignment.

The existing chimney flues had to be interconnected and a 20-ft. tunnel cut through the concrete foundations of No. 4 furnace stoves to connect with the flues of the new stoves. This work, including the interconnection of the boiler flues to equalize drafts in the two existing stacks, was made with both No. 3 and No. 4 furnaces in blast.

The original plant had been designed for only two blast furnaces, and the cold blast mains were located underground and arranged in such a way that it was impossible to connect the cold blast main of the new blast furnace with the existing turbo-blowers. In order to enable any turbo-blower to blow any of the three blast furnaces it was decided to change entirely the cold blast main system, all mains being placed overhead and connected accordingly. This difficult work was performed during the severest winter known in this locality, and without interfering with the operation of the existing blast furnaces.

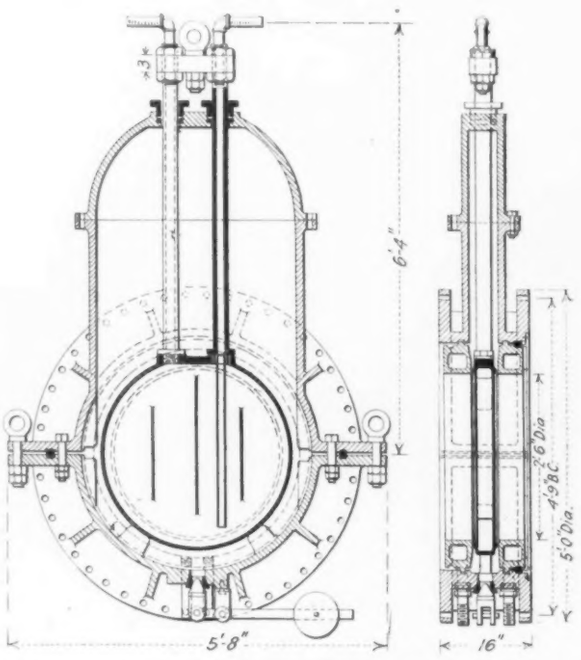
The iron and steel work for the blast furnace, stoves, gas washer, hot blast and cold blast main system, was furnished by John Mohr & Sons, to whom credit is given for dispatch in fabricating and erecting the material and for excellent workmanship.

To provide ore for the new furnace a 350-ft. extension of the existing ore dock and ore storage yard was necessary; and as the old type of construction had proved entirely satisfactory, the same type was adopted for the extension. The work was done by the Great Lakes Dredge & Dock Co. A combined ore unloading and ore handling bridge of 300-ft. span equipped with man trolley, operating an automatic grab bucket having a capacity of 11 tons, was furnished by the Mead-Morrison Mfg. Co., thus adding to the present equipment of three ore bridges.

The ore is delivered by boats alongside of the dock face, from which the ore is unloaded by the bridges. The ore is then discharged into deflecting hoppers built in the framework of the dock shear leg towers, and from the hoppers into railroad cars, or the ore is delivered directly to transfer cars traversing the ore bins.

The new ore, coke and limestone bins are of the Baker suspension type, built of reinforced concrete and steel. The bin system occupies a space of 169 ft. and consists of nine ore, five limestone and one scrap bin, discharging into scale cars, and one double coke bin discharging directly into the skip cars. The bins were furnished by Arthur G. McKee & Co.

Before these bins could be installed the existing high-line had to be removed and relocated during the operation of the other furnaces, an intricate job, as the high-line consisted of three types of trestle necessitating the relocation of the entire high-line of 600 ft. in length, so as to keep the same relative position. To avoid interference with the operation of the transfer car on the high line, only one track of the double-track structure was removed at one time, while the skip tank was being installed. The skip pit required an excavation of 40 ft. below yard level with a head of water of 35



Mathesius Hot-Blast Valve in Which Is a Tapered Gate Swinging Between Parallel Seats

Building the Hot Stoves

the blacksmith shop removed, excavating and pile-driving was begun, an extension meanwhile being added to the boiler house. The work of erecting the stove shells moved quickly and meanwhile the foundations for the gas-washing apparatus went forward.

Aug. 10, 1917

Aug. 28, 1917

Sept. 19, 1917

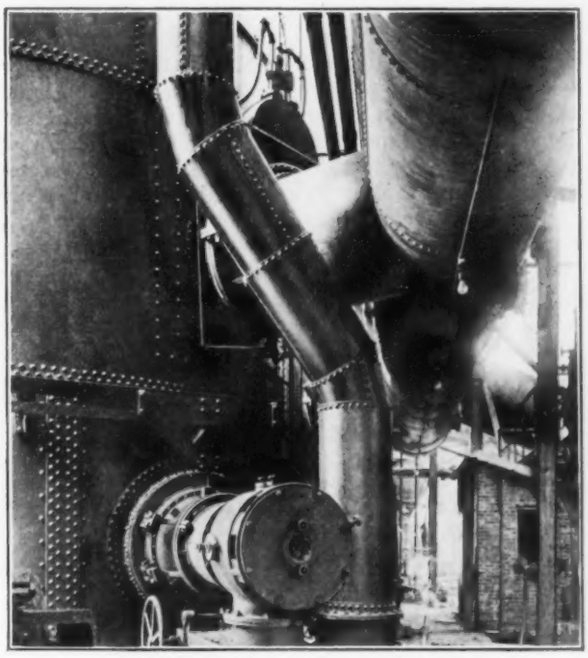
Nov. 26, 1917

ft. After completion of the skip tank, the other track was removed and the bins were installed. The filling of furnaces Nos. 3 and 4 was not once interfered with by this work.

The skip incline is designed as a self-supporting structure of the cantilever type, inclined 60 deg. from the horizontal, and is supported entirely independent of the blast furnace, thus to keep its load off the furnace. The skip structure was furnished by the Worden-Allen Co. It is 171 ft. long with double track for the two heavy skip cars of the trailer truck type. The weight of a skip load is 8 tons of ore, and each car holds 110 cu. ft. of coke.

The skips are operated by a Lidgerwood electric hoist of the double drum single-motor type. The motor is of the Westinghouse type, and of 200 hp. capacity, equipped with Cutler-Hammer control. The hoist is located in a concrete and brick structure directly under the skip truss, and above the iron ladle tracks. This structure also houses the bell cylinders for raising and lowering the bells operated by air from the cold blast mains. The skip cars and bells are operated from the scale car.

The steel and tile roof of the existing cast house was remodeled to fit the skip incline and furnace, and an extension to the cast house was made for the purpose of providing a modern lavatory and locker room for the comfort of the blast-furnace men.



The Mathesius Valve, In Upper Part of View, May Be Withdrawn from Path of the Blast

At the site of the proposed stoves was located the company's blacksmith shop, a brick structure 30 ft. x 40 ft. It was moved some 300 ft. and placed on new foundations in about ten days. The steel towers carrying the power lines to the ore bridges were dismantled, the lines being placed underground which necessitated a tunnel some 700 ft. long.

A passenger and freight elevator of 1500-lb. capacity, traveling at a speed of 150 ft. per min., gives access to the top of stoves and blast furnace. It is located adjacent to one of the stoves and is 100 ft. high.

The cold blast is supplied by an Ingersoll-Rand turboblower of 45,000 cu. ft. capacity. For additional steam requirements two 550-hp. Rust boilers with superheaters were installed, necessitating a 40-ft. extension to the existing boiler house. The boilers were equipped with Birkholz-Terbeck premixing gas burners. No addition to the power house was required, there being room for the installation of the new turboblower and of a 600-kw. turbogenerator furnished by the De Laval Steam Turbine Co. Condensing equipment for the turbogenerator and turboblower, of a size to take care of an additional blowing engine, was furnished by the Alberger Pump & Condenser Co. Additional pumping capacity is being furnished by a 20-million gal. De Laval centrifugal pump. A second double-strand Heyl & Patterson pig-casting machine was installed, together with a ladle-tilting device serving the four strands of the machine. The necessary new pipe work for water, steam, air and oil lines, as well as the remodeling of the existing piping occasioned by the installation of the new blast furnace, was done by the Pittsburgh Piping & Equipment Co.

The showing made in the construction of the furnace, which involved the placing of some sixty subcontracts, is credited to the spirit of co-operation on the part of owners, engineers and contractors, by which the best efforts of all concerned were concentrated on the fulfillment of the task they had set out to do. A dinner was given by the owners to Freyn & Co. to celebrate the blowing-in of the furnace.

The Henry A. Hitner's Sons Co., Philadelphia, dealer in iron and steel scrap, has acquired a site of 38 acres at Richmond and Buckius streets, Bridesburg, that city, for a scrap yard.

Economic Factors in the Iron Industry*

Conditions Which Led to the Locating of Iron Plants in Allegheny Valleys—Importance Then of Water Routes to Markets

BY DR. MALCOLM KEIR

THE valleys chosen by the first American pioneers were those that cut across the foothills of the Alleghenies,[12] and blazed an almost continuous highway from Alabama to Canada. Although it was comparatively easy to travel north or south along these pathways, journeys westward were blocked by the Alleghenies and eastward by innumerable hills, especially in New England. As a consequence, the new clearings were forced to be self-sustaining, for their wants could not be fulfilled by the established settlements that bordered the Atlantic. Among the pioneers in these valleys, therefore, a new market for iron goods arose that necessarily was dependent upon local production. Furthermore, the articles demanded by the frontiersman were entirely different from those needed in shipbuilding or commerce and called for new specialized iron manufacture.

Why Forges Located in Allegheny Valleys

These settlers had a small but vital use for iron because life, sustenance and home depended upon a few iron tools. Foremost among these was the pioneer's gun, without which he would not dream of venturing forth. Protection in a wilderness full of enemies, sustenance in a land where food must be shot, clothing on a frontier where looms, fullers and tailors were absent, all these wants were satisfied by a gun. Next to his firearms the pioneer valued his axes, for with these he made his home and his barns, hewed his roadways and gathered his fuel. With no other tools than a gun and an axe a man might live in security and comfort; nevertheless, most pioneers added to their equipment shovels, hoes, scythes, pots and kettles for potash or wood ashes and for reducing maple sap.

The valley settlements, therefore, called for firearms, edged tools, simple agricultural implements and household utensils, all made from iron. Fortunately the materials to supply this demand were at hand in the valleys themselves.

The entire length of the valleys from north to south was underlaid by limestone, and veins of iron abounded from Canada to Alabama. Rock ore and lime, two of the essentials for an iron industry, were therefore present where they were most needed, and the third requisite, wood for charcoal fuel, was of course ample in amount. As a result, wherever a small community appeared a forge or furnace was almost certain to follow. These supplied local needs by local production from local materials.

Here, however, a further resemblance to the seaboard iron industry must be noted. It will be remembered that it, too, was a local industry in each colony, but that iron making arose to prominence in just one, Massachusetts, because the Bay Colony offered the most extensive market. Likewise, in the interior valleys, two places from which there was easiest access to markets, became the leaders in frontier iron manufacture. These two selected communities were Salisbury, Conn., and Lancaster, Pa.

How Salisbury Became an Iron Center

Near Salisbury, on land granted to Yale College by the colony, ore was discovered in 1732. Two years later when the college disposed of its hundred acres, development of the iron deposits commenced, and they have been mined ever since. Their greatest importance, however, was in the hundred years after the middle of the eighteenth century. Following 1750 they soon rose to prominence, and no less than 30 furnaces surrounded Salisbury within a circle of 30 miles. By 1800 there were 50 bloomary forges in Litchfield County, Conn., in which Salisbury is located, not to mention many others nearby in Massachusetts and New York.

Two causes contributed to the esteem accorded to Salisbury iron: one, the unusual quality of the iron; the other, the ease by which it could be carried to market. The ore yielded a metal which was equalled in only one other locality—the Juniata Valley of Pennsylvania—and was particularly adapted to the manufacture of firearms or edge tools. It stood as high as the best Swedish iron or even English mild steel. Furthermore, the ore deposits were so located that they commanded the routes north or south along the Connecticut, Housatonic, Mohawk and Hudson river valleys. Water carriage was absolutely essential for the existence of any iron works that were situated beyond a few miles of land haul from the consuming market. In 1783 the cost of transporting one ton of freight from Albany to Fort George, a distance of 65 miles, was $32, or 49 cents a ton-mile. On the other hand, a ton could be carried from New York City to Canada by way of the Hudson and Lake Champlain for $55, or about 12 cents a ton-mile. Hence a heavy commodity such as iron could be conveyed only a short distance by the expensive overland methods, but might travel four times as far by water. That helps to explain why Salisbury iron could enter New York City, 75 miles away, and why Lancaster, Pa., products within 60 miles of Philadelphia were seldom seen in that city, although they were commonly sold in Baltimore, fully 40 miles farther away, but reached by the Susquehanna River.

Besides its high-grade ore and access to markets, Salisbury was surrounded by limestone, and the encompassing Berkshire Hills were covered with forests. The natural consequence of this combination of advantages was the high standing of Salisbury in the early iron trade.

Lancaster the Important Inland City

Just as the Connecticut village stood at a point where the chief northern water highways could be reached readily, so also Lancaster, Pa., held a

*Continued from page 929, issue of April 11.

[12]The Connecticut, Housatonic, Mohawk, Lehigh, Shenandoah and Cumberland.

corresponding strategic position upon the routes toward the south and southwest. The main artery of travel extended from Philadelphia to Lancaster, where a branch ran into the Great Valley southward, while a second turned westward by way of Harrisburg and the Juniata River. Lancaster, too, was the metropolis for a wide agricultural valley splendidly endowed with fertile limestone soils. In 1777 Congress sat at Lancaster for a few days, and from 1779 to 1812 it was the capital of the state. In short, it was the largest and most important inland city in the country throughout the first quarter of the nineteenth century. Here, then, was an admirable market for iron, because settlers bound for the south or west would equip themselves here, the place nearest to his future home. The farmers of the county would look to the city for tools and utensils, and the needs of the city itself would create a demand for iron goods.

The natural means for supplying this market were at hand, for the whole of Lancaster County and its neighbor, Chester County, are dotted with deposits of iron, and the entire area is underlaid with limestone. The presence of ore, flux and forests for fuel removed every obstacle to an iron industry once a market was assured. Lancaster, therefore, became the center of an iron-producing region that claimed 17 furnaces in 1786, and 50 years later boasted over 100, at which time it ranked among the principal iron makers in the entire country.[13]

Valley Plants Ignored British Prohibition

Although the expansion of the United States and the opening of new distant markets have brought about a relative and absolute decline in the importance of the Great Valley furnaces, yet they have left their impress upon modern industrial life in rather curious ways. To protect her own foundries, England in the middle of the eighteenth century prohibited the colonies from fabricating iron. This order was well obeyed on the Atlantic coast where English officers were numerous and population relatively dense, but the Great Valley furnaces, remote and isolated, ignored the law and carried on iron manufacture clandestinely. Guns were the chief products because they had a ready sale, a high value and were easily carried or hidden. So numerous were the gun makers in the hills along the Great Valley that the Continental Congress called them together at Springfield, Mass., and Harpers Ferry, Va., to manufacture arms for the government. These two places were the seats of the first two United States arsenals.[14] From Springfield gunmaking spread southward into Connecticut and the great factories at Hartford (Colt's), New Haven (Winchester's) and Bridgeport (Remington) are the direct descendants in modern times. The armory at Harpers Ferry was planted in poor industrial soil and so it has borne no fruit.

The admirable quality of Salisbury iron gave rise to numerous edge tool works in the Housatonic, Naugatuck and Connecticut river valleys, and the edge tool business of the United States is to-day centered there. Consequently the iron industry of the Great Valley is not without its significance, even to-day.

(To Be Continued)

[13] After Salisbury and Lancaster had become firmly established in iron making, a curious situation arose, appearing then markedly for the first time but repeated often in the subsequent history of iron: the smelting of pig iron from ore was separated from the manufacture of the pig iron into finished products. The reduction of ore to metal usually occurs where the raw materials are found, for although it is highly desirable that pig iron be manufactured near its market it is not absolutely essential. Pig iron is easily handled in bulk and is valuable enough to stand fairly long shipments. Eastern Massachusetts, for over a hundred years, was the principal center for the smelting and manufacturing of iron, but after 1750 with the disappearance of both bog ore and forests pig iron was secured from the Salisbury district to the west, where ore and fuel were plentiful. In like manner, Lancaster supplied the foundries of England with pig iron, shipping it by way of the Susquehanna River and the port of Baltimore.

[14] Established at Springfield 1778 and at Harpers Ferry 1794.

IRON AND STEEL IN AUSTRALIA

Broken Hill Proprietary Co.'s Output in 1917

(Special Correspondence)

SYDNEY, N. S. W., March 7.—Reports of the production of iron and steel in Australia in 1917 were issued late in February. They covered the operations of the Broken Hill Proprietary Co.'s plant at Newcastle, N. S. W., by half years, and were as follows:

	Half Years Ending— May 31, 1917 Gross Tons	Nov. 30, 1917 Gross Tons
Pig iron	61,403	41 351
Steel ingots	77,676	52,878
Blooming mill	76 812	57 065
Rail mill	47,833	34,474
18-in. mill	7,767	7,461

The smaller totals toward the latter part of 1917 were due to a three-months sympathetic strike. Active production by the 12-in. and 8-in. mills began in July, the output being 988 tons of merchant bars. The equipment for turning out plates for shipbuilding and plates for a second blast furnace and stoves was nearing completion when the reports were made. In addition to the existing mills a continuous rod mill is being erected. The machinery was imported from the United States. This mill will meet the demand for fencing and other wires.

The quantity of ore from Iron Knob, the company's main source of supply in South Australia, was 164,257 tons, of which 123,522 tons was sent to the Newcastle plant and the rest to outside consumers.

Uniform Wage Scale

WASHINGTON, April 16.—For the purpose of reducing to a minimum the labor turnover in the eastern shipyards which has resulted from the maintenance of several different wage scales on the North Atlantic, the South Atlantic and the Gulf coasts, the Shipbuilding Labor Adjustment Board, after elaborate investigation and numerous hearings accorded to both shipyard managers and representatives of the several trades involved, has adopted a substantially uniform wage scale for the three districts referred to. As the result of this action, there will be no further inducement to ship workers to quit their jobs in one district in order to obtain an increase in wages in another district. Journeymen's wages are practically uniform and the differences in the compensation of certain inferior grades of labor are too small to induce migration.

As a preliminary step to the adoption of this uniform scale the board handed down its decision in reference to wages, hours and other conditions in the shipyards under its jurisdiction on the North Atlantic coast and the Hudson River. The rates fixed were made retroactive for the region about New York Harbor, including Bridgeport, to March 11; for the shipyards north of Bridgeport, to March 20, and for the other yards, to April 1.

The Becker Milling Machine Co., Hyde Park, Boston, is now quoting much better deliveries on milling machines and milling cutters than have been available in recent months. Deliveries range from one week to four or five months, depending on the models required.

EFFICIENT TOOL-ROOM SYSTEM

Centralized Grinding and Systematized Collection and Delivery of Cutting Tools

The number of machine shops yet to be found, some of them large, in which machine hands stop their machines and go to a grinding wheel to grind their cutting tools, is surprising, especially in view of the fact that such work can be better done by an employee less costly than a high-priced machinist, provided the proper equipment and system is used. That the centralized grinding of tools by a man or men who make it their exclusive work is conducive of greater production is evidenced in a striking way by experience in large shops, even those abroad, the managers of which have lately been frequent buyers of American tool-grinding machines. War pressure has caused them to adapt every expedient that leads to maximum output, and some of the large foreign shops now have batteries of grinding machines, and cutting tool reserves ready for use.

Another refinement, aside from having a central place for tool storage, the necessity of which is admitted, is bridging the gap between tool-room and the machines which use the tools. It is by no means sufficient that the tools, dies, jigs and fixtures should be kept in orderly array, accessible, hand checked as to location when absent from their place in the tool-room.

To the requirements of his shop in the direction referred to, John Goetz, vice-president and works manager of the Kempsmith Mfg. Co., Milwaukee, Wis., has devised a system for bridging the gap between tool-room and machine tools which eliminates the waste of time which must result when machinists or other workmen leave their machines or work to go to the tool room. Perhaps the most notable feature of Mr. Goetz's system lies in the program he has laid out for his tool grinder, which is observed rigidly.

Just back of the tool grinder's position at the Gisholt universal tool grinder used in the Kempsmith plant is a bulletin board on which is the tool grinding chart devised by the Gisholt Machine Co., and other charts made by Mr. Goetz himself for the special needs of his shop. They display not only line drawings of the cutting end of the tools to be ground, but also give the angles at which the grinder tool holder must be set to attain the desired result in back or side slope or rake, end and slide clearance, etc. After fastening the tool in the holder, the operator consults the chart, and then adjusts the four graduated circles by which the holder is placed in any desired position. Adjacent to the charts are two detachable boards on which are mounted blue prints giving other grinding data. Convenient to the operator is a cabinet containing trays for the various tools. This, and the boards, are shown in the accompanying halftone.

It was to utilize to advantage that portion of the grinder's time when he was not operating his machine that Mr. Goetz laid out the following routine instructions for the grinder to follow in conformance with the plan of eliminating visits to the tool-room by foremen and the men under them, with its consequent loss of time and production:

This Order Must Be Sent to the Tool-Room
One Hour Previous to Stated Time

Deliver the following jigs and tools at.....o'clock

for Order No..... To Dept. No.....

	Pat. No.	Oper.	Tool or Fixture No.	Check No.	Remarks
For Milling					
For Planing					
For Turning					
For Drilling					
For Grinding					

.....19.... Foreman.....

ORDER TO TOOL-ROOM

To Gisholt Tool Grinder Operator

"1. It is essential that you keep your machine clean and orderly at all times. Before starting your machine, wipe the emery from all bearings and slides, also from around all holes; oil all parts every morning, noon, and oftener, if necessary; see that all oil holes are closed to prevent emery getting into bearings.

"2. Grind tools, in conformance with chart instructions, until 8.30.

"3. At 8.30 go to the screw department and there remove tools which need repairing, replacing them with new tools immediately.

"Do the same at the lathe department.

"Do the same at the chuck lathe department.

"Do the same at the planer department.

"At 2 p. m. make the same trip and perform the same duties again, placing the worn tools collected on the second trip on the shelf reserved for tools to be delivered to the blacksmith.

"4. After completing the morning collection of worn tools get them ready for the blacksmith, sorting them and tying them together with tags attached designating by style and number how the tools are to be forged. Short pieces should be used for tools to be used in making the lighter cuts, such as threading and cut-off tools. When pieces are too short for lathe use, have them annealed for cutter and reamer blades.

"5. Take tools needing repair to the blacksmith shop, place them on the tool bench, and bring in finished forged and hardened tools, placing them on shelf reserved for tools needing grinding, near your machine.

"6. All forged tools from the blacksmith's shop must be rough ground ready for hardening, after which they are placed on the shelf reserved for tools for blacksmith shop delivery. This delivery is to be in the morning, as indicated in No. 5.

"7. The chart will show how many tools are to be kept on hand in shelves ready for use at all times. In addition, you are to keep at each machine the allotted number of tools. When machines are not in use all tools must be restored to the tool shelves.

"8. When replacing tools which have become too short, or where it is necessary to supply new tools to make up the required number, get an order from your foreman for a bar of sufficient size to make up a lot. Take the bar to the milling department foreman with an order stating the size of bar, number of pieces to be cut and their length. You are to see they are delivered to you, cut in the required number, within reasonable time. If this is not done notify your foreman. This work is to be done when you are executing instruction No. 4. On all new tools the blacksmith is to stamp the name of the steel used.

"9. You visit the blacksmith shop only once a day, after completing the collection in the morning and the subsequent sorting and tagging. All business with the blacksmith is to be transacted at that time, except by order of your foreman.

"10. Keep a record of places where certain tools are most used, so that you always will have enough for immediate use.

"11. Clean your machine every evening, or when you have caught up with your work and there are no more tools to grind.

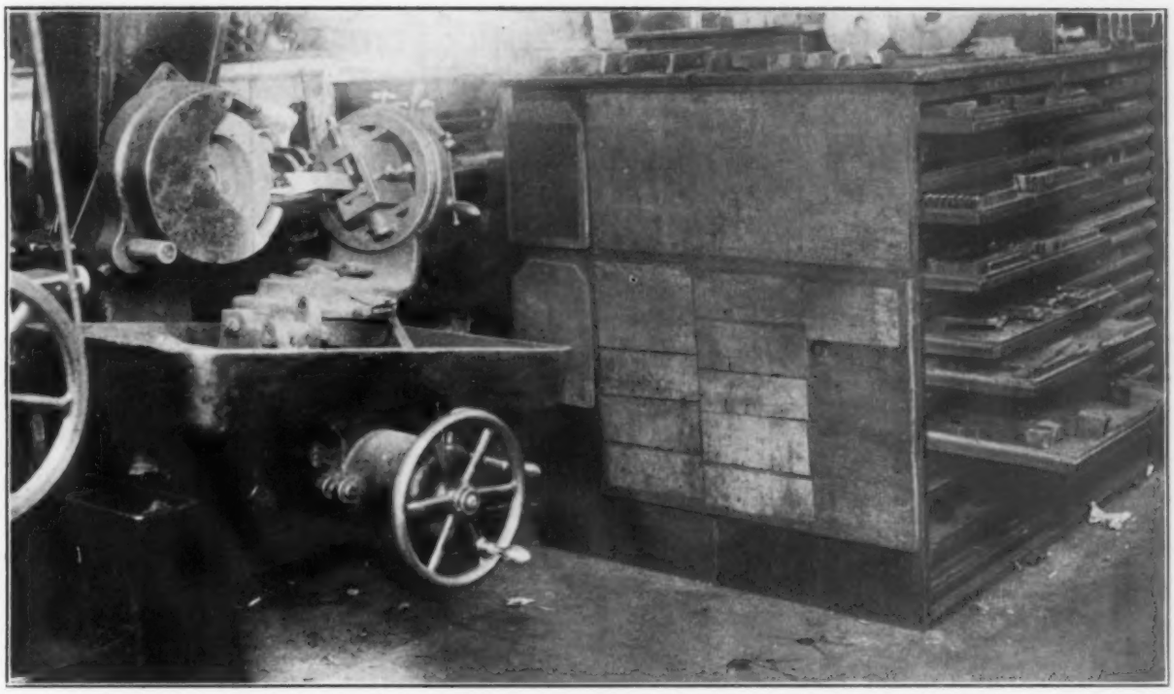
"12. If you do not know how to proceed at any time ask your foreman what you should do. You will be given credit for the orderly condition of your machine and the quality of your work.

Safety Rules for Operator

"1. Never remove the wheel guard from your grinding machine except to clean machine.

"2. Have tools securely fastened before applying wheel.

"3. Always look for defects in the wheel, such as a



Method Used in Shop of Kempsmith Mfg. Co. of Keeping Accessible to the Grinder of Cutting Tools Data He Uses in Operating the Gisholt Universal Tool Grinder. Instructions on the board show him how to adjust his machine to get precise and proper rake and clearances

crack or broken edges. Never grind with a cracked wheel, as the centrifugal force may cause it to fly apart and you may be hurt. If a wheel is faulty, notify your foreman and secure a new wheel before you start your machine.

"4. Examine new wheels for defects before placing them in the machine.

Setting Machine and Grinding

"Keep your wheel sharp at all times by dressing it frequently. Take care not to burn finished or hardened tools while grinding. (Here follow instructions for operating the Gisholt Universal Tool Grinder.) Use goggles furnished by the company when grinding."

To bridge the gap between tool room and machine operators, it being thoroughly understood that operators are not to waste their time in going to and from the tool room, what are termed "call boys" go to each of the several foremen four times a day, and obtain information as to what tools are wanted in the various departments. Whatever a foreman may need he specifies on an application blank, which is reproduced on the preceding page.

A requirement in the delivery of tools or jigs to be used on any machine is that they are to be on hand in ample time for the set-up for the next job, in fact they must be delivered before the job in progress has been finished.

A plan which has been found of great value in the handling of jigs and fixtures, inasmuch as it permits their easy storage and speed in handling, and insures the keeping together of all the parts of each device, consists of separate boxes for each jig or fixture. At either end of the boxes are hand-holes so that they may be conveniently lifted. Inside each box, near the top, is a wooden frame which holds in place a blue print listing all the parts of the jig or fixture, and it is a part of the duty of the men who have charge of the delivery and removal of the tools to refer to the list and check every piece whenever the parts are replaced in their respective boxes.

The new open-hearth plant of the Erie Forge & Steel Co., Erie, Pa., which is being erected by the Erie Forge Co., as a separate unit to be devoted exclusively to Government work, is nearing completion, and it is expected that the two open-hearth furnaces will be ready for operation about April 20.

Special Board of Appraisers

WASHINGTON, April 16.—In view of the extent to which the powers of the President and the Secretary of War to commandeer property for the use of the Army have recently been invoked it has been deemed necessary to appoint a special board of appraisers to determine the compensation to be paid in such cases in order that the owners of the property thus taken over may not suffer as the result of unnecessary delay or prolonged litigation in seeking recovery through the courts to which they are relegated by general and special statutes heretofore enacted. A very large number of cases are now pending in which both property and material of various kinds have been commandeered, but in which it has proven difficult, if not impossible, to provide fair compensation in a reasonably expeditious manner for lack of legalized appraisal. The board of appraisers, which has now been constituted to handle these cases and others that may arise, is composed of Lieut.-Col. John S. Dean, National Army, and Lieut.-Col. R. H. Montgomery, National Army, with additional members to be appointed from time to time as the public service may require.

Molders in Chicago District Demand Wage Increases

Molders employed in the 16 or 17 union jobbing foundries of Chicago, whose wage agreement expires May 1, have made a demand for $6 per day of 8 hr. instead of $4.50 for 8 hr. The local manufactories and non-union jobbing shops, on which no demand has been made, operate 9 hr. per day. Union molders in the Fox Valley district, including Aurora, Geneva, Joliet and other places, demand that their daily rate be raised from $4.25 to $5.50. Definite action may not be taken in Chicago for some days. Most of the union jobbing shops are small.

Publications of timely interest issued by the Guaranty Trust Co., 140 Broadway, are available in booklet form, and may be had on request. Some of these cover the following topics: America's foreign trade; regulation of exports under the espionage act; trading with the enemy; United States shipping act; federal income tax law; War Excess Profits Tax Law; Cuba; Russia, etc.

To Increase Domestic Ore for Ferroalloys

Comprehensive Plan for Government Operation of Mines—President May Increase Tariffs—Revolving Fund of $50,000,000

WASHINGTON, April 16.—The action of the House Committee on Mines and Mining, which has just ordered a favorable report upon the Foster bill "encouraging the production, conserving the supply and controlling the distribution of those ores, metals and minerals which have formerly been largely imported or of which there is or may be an inadequate supply," has brought squarely before Congress a problem of the greatest importance to the iron and steel industry. The bill is designed to put into effect the idea conceived some months ago by Secretary of the Interior Lane that a large saving can be effected in shipping space and a considerable number of vessels obtained for the transportation of troops, material and food to France by substituting domestic metals and minerals, including the principal ferroalloys, for those which heretofore have been imported.

Considerable progress in the substitution of domestic for imported products by voluntary agreement has been made as the result of conferences held between the War Industries Board and producers and consumers, notably in the case of manganese and chromium, but the field is so broad and the necessity for adopting uniform methods for treating the problem so apparent that the Government officials handling the matter have been forced to the conclusion that nothing short of a comprehensive law on the subject will meet the requirements of the situation.

Wide Range of Controlled Minerals

The general purposes of the Foster bill are set out in the first section of the message as follows:

> That by reason of the existence of a state of war, it is essential to the national security and defense, for the successful prosecution of the war, for the support and maintenance of the Army and Navy, to assure an adequate supply, equitable distribution, and to facilitate the production and movement of necessaries, which necessaries are defined in this act to include only the following named mineral substances and ores, minerals, intermediate metallurgical products, metals, alloys, and chemical compounds thereof, to wit: antimony, arsenic, ball clay, bismuth, bromine, cerium, chalk, chromium, cobalt, corundum, emery, fluorspar, ferrosilicon, fullers earth, graphite, grinding pebbles, iridium, kaolin, magnesite, manganese, mercury, mica, molybdenum, osmium, sea salt, platinum, palladium, paper clay, potassium, pyrites, radium, sulphur, thorium, tin, titanium, tungsten, uranium, vanadium, zirconium, and of other rare or unusual elements, the supply of which, in the judgment of the President, may be inadequate for war and industrial needs; to prevent, locally or generally, scarcity, monopolization, hoarding, injurious speculation, manipulation and private controls affecting such supply, distribution and movement; and to establish and maintain governmental control of such necessaries during the war and thereafter only until, in the judgment of the President, the agencies and activities herein provided for can be reasonably terminated. For such purposes the instrumentalities, means, methods, powers, authorities, duties, obligations, and prohibitions hereinafter set forth are created, established, conferred and prescribed.

The President is authorized through the Secretary of the Interior to make such regulations as may be necessary to carry out the provisions of the proposed law and in its execution the Secretary may enter into any voluntary arrangements or agreements, use any agency, accept the services of any persons without compensation, co-operate with any agency or person, and co-ordinate the activities of all agencies so as to avoid preventable loss or duplication of effort.

Pomerene Provision as to Interest in Contracts

In view of the fact that the Government, to operate effectively the system proposed by the Foster bill, must obtain the co-operation of many persons familiar with the industries affected and perhaps actually engaged therein, the framers of the measure have incorporated at the outset a provision designed to obviate a situation which heretofore has developed in the Council of National Defense as the result of the membership upon its committees of persons interested in concerns having contractual relations with the Government. This provision of the Foster bill, which follows closely the so-called Pomerene law, is as follows:

> Sec. 3. That no person acting either as a voluntary or paid agent or employee of the United States in any capacity, including an advisory capacity, shall solicit, induce, or attempt to induce, any person or officer authorized to execute or to direct the execution of contracts on behalf of the United States, to make any contract or give any order for the furnishing to the United States of any necessaries or other property covered by the provisions of this act, if such agent or employee has any pecuniary interest in such contract or order, or if he or any firm of which he is a member, or corporation, joint-stock company, or association of which he is an officer or stockholder, or in the pecuniary profits of which he is directly or indirectly interested, shall be a party thereto. Nor shall any such agent or employee make, or permit any committee or other body of which he is a member to make, or participate in making, any recommendation concerning such contract or order to any council, board, or commission of the United States, or to any member or subordinate thereof, without making to the best of his knowledge and belief a full and complete disclosure in writing to such council, board, commission, or subordinate of any and every pecuniary interest which he may have in such contract or order and of his interest in any firm, corporation, company, or association being a party thereto. Nor shall he participate in the awarding of such contract or giving such order. Any wilful violation of any of the provisions of this section shall be punishable by a fine of not more than $10,000, or by imprisonment of not more than five years, or both.

To strengthen still further the above provision the bill provides that any agent or employee of the United States who, contrary to the provisions of this measure, shall receive any profit from any contract, or any firm of which such agent is a member which may make any gains under any such contract, shall forfeit such profits or gains to the Government and the same may be recovered by the United States in any appropriate action in the proper district court.

Waste and Hoarding Forbidden

In providing restrictions upon waste, deterioration, hoarding, etc., the Foster bill follows closely the Lever food, feed and fuel act and renders unlawful wilful waste, preventable deterioration, hoarding, monopolizing, the fixing of unreasonable prices, the limiting of facilities for transporting, producing, manufacturing, supplying, storing, or dealing in, or conspiring with other persons to commit any of these unlawful acts. In line also with the Lever act is a provision of the Foster bill authorizing the Secretary of the Interior, with the approval of the President, to license the manufacture, storage, mining, distribution, or use of any of the metals or minerals covered by the proposed law. The Secretary of the Interior is authorized to revoke licenses whenever the holders thereof are found guilty of attempting to obtain unjust, unreasonable, or discriminatory or unfair "prices, royalties or commissions" for the materials included in the scope of the measure.

Whenever any of the commodities referred to are found to have been hoarded they may be proceeded against in any district court and seized by a process of libel for condemnation and may be sold in such manner as to provide the most equitable distribution thereof in view of the Government's needs respecting the material in question. Severe penalties, involving heavy fines

or imprisonment or both, are provided for persons who destroy any of the commodities referred to or who conspire with other persons to limit their production, transportation, or distribution.

President May Take Over All Supplies

One of the most important features of the Foster bill authorizes the President, whenever in his judgment it may be required for the successful prosecution of the war, to requisition any or all of the commodities covered by the bill upon paying a just compensation. This compensation is to be determined by the President, but if it is not satisfactory to the owner of the commodities he shall be paid 75 per cent of the amount originally tendered and may sue in the United States district courts to recover any balance claimed to be due. In addition to requisitioning or commandeering the commodities referred to the Secretary of the Interior is authorized to enter into contracts for periods not exceeding two years to purchase such commodities and to sell them at reasonable prices to be fixed by the Secretary with the approval of the President. In this respect the Foster bill differs from the statutes heretofore enacted in that neither the Federal Trade Commission nor any other agency charged with cost finding will have a part in fixing prices under this measure.

With a view to protecting agreements heretofore made respecting the prices of the metals or minerals covered by the bill it is provided that "if any minimum prices shall have been theretofore fixed, then the price paid for any such articles so purchased shall not be less than such minimum price." No contracts may be made under the terms of the Foster bill after the termination of the war and all moneys received in connection with sales of commodities are directed to be used as a revolving fund for the purchase of additional supplies.

Government May Operate Mines

Experts who have conferred with the Committee on Mines and Mining have suggested that in order to meet the war requirements of the Government in some of the metals and minerals enumerated it may be necessary for the Government to take over mineral lands and develop them on its own account. This might be necessary because of the difficulty of obtaining private capital to development deposits of minerals desired chiefly for war purposes and for which cheaper substitutes would be imported upon the restoration of peace. This consideration has threatened to imperil the success of Secretary Lane's comprehensive plan to save shipping. To meet this contingency, however, a carefully worked out provision has been added to the bill, which in part is as follows:

> Sec. 12. That whenever the President shall find it essential to the successful prosecution of the war to secure an adequate supply of necessaries he is authorized, through the Secretary of the Interior, to requisition and take over, for use or operation by the Government, any undeveloped, insufficiently developed or operated, or idle mineral land or deposit, mine, smelter, or plant and to develop, operate, or cause the same to be developed or operated in such manner and through such agency as he may direct. . . . The Secretary of the Interior, with the approval of the President, is authorized to prescribe such regulations as he may deem essential for carrying out the purpose of this section, including the operation of any such mineral land or deposit, mine, smelter, or plant, or part thereof, the purchase, sale, or other disposition of articles used, manufactured, produced, prepared, or mined therein, and the employment, control, and compensation of employees. . . .

The section provides for compensation to be fixed by the Secretary of the Interior and for suit after 75 per cent has been paid if the amount fixed is not satisfactory. All money received by the Government may be used as a revolving fund for continued plant operation.

A prohibition against so-called "evil practices" is embraced in the Foster bill, such practices being defined to be undue enhancement, depression, or fluctuation of prices, injurious speculation, unjust market manipulation, or misleading market quotations of the prices of the metals or minerals referred to. Persons guilty of these offenses are liable to severe penalties.

The artificial or arbitrary maintenance of the prices of commodities which may be imported as well as produced from domestic deposits has presented a peculiar problem to the framers of the Foster bill, and in order to meet it they have been obliged to clothe the President with power to readjust the customs duties on the metals and minerals covered by the measure whenever it may be necessary to maintain a parity between the imported and the domestic article. For the purpose of stimulating production the President is authorized "reasonably and as far in advance as practicable, to determine and fix and give public notice of what, under specified conditions, are reasonable guaranteed prices, in order to assure such producers a reasonable profit." Such proclamation having been made, the Government thereafter "guarantees every producer of these specified necessaries that, upon compliance by him with the regulations prescribed, he shall receive for any necessaries produced in reliance upon this guaranty within the period, not exceeding two years, prescribed in the notice, a price not less than the guaranteed price therefor as fixed pursuant to this section."

President May Raise Tariffs

But when the President finds that the importation of any of these articles "materially enhances or is likely materially to enhance the liabilities of the United States under guaranties of prices therefor made pursuant to this section, and ascertains what rate of duty, added to the then existing rate of duty, if any, on each of the necessaries and to the value of each of the necessaries at the time of importation, would be sufficient to bring the price thereof at which imported up to the price fixed therefor pursuant to the foregoing provisions of this section, he shall proclaim such facts, and thereafter there shall be levied, collected and paid upon each of these necessaries, when imported, in addition to the then existing rate of duty, the rate of duty so ascertained; but in no case shall any such rate of duty be fixed at an amount which will effect a reduction of the rate of duty upon any of these necessaries under any then existing tariff law of the United States."

Government May Buy and Sell

For the purpose of making any guaranteed price effective, or whenever it is essential in order to protect the Government against material enhancement of its liabilities arising out of any guaranty, the Secretary of the Interior is authorized to purchase any of the commodities referred to for which a guaranteed price shall be fixed and to sell to the Allies or to citizens of the United States, or to hold the commodities in storage, or use them as supplies for any department or agency of the Government.

Whenever it may appear that limitation, regulation, or prohibition of the use of any of the commodities referred to is essential in order to assure an adequate and continuous supply for the national security and defense, the President is authorized to take the necessary steps to that end. After due notice has been given persons failing to conform thereto render themselves liable to severe penalties.

President Must Report to Congress

To carry out the purposes of the proposed law, $50,000,000 is appropriated to be used as a revolving fund and in this connection an unprecedented stipulation is incorporated to enable Congress to keep in touch with the operations of the Executive. It is provided that itemized statements covering all purchases and disbursements of the metals and minerals referred to shall be filed with the Secretary of the Senate and the Clerk of the House on or before the 25th day of each month after the act takes effect, covering the business of the preceding month, such statements to be subject to public inspection. This provision is a long step in advance of any similar legislation heretofore attempted. In addition to these monthly reports the President is required to make a detailed statement of all operations under the proposed law which must be forwarded to Congress on Jan 1 of each year, covering all proceedings during the previous twelve months. These state-

ments are required to contain a list of all persons employed together with their compensation and a detailed account of the different kinds of property purchased or requisitioned.

To Release Shipping Carrying Ores

Representative Foster who, as Chairman of the Committee on Mines and Mining, is in charge of this bill as the Administration's representative, is in negotiation with the House leaders to obtain an agreement for its early consideration. Several important appropriation bills are now on the calendar and have the right of way over general legislation but Mr. Foster hopes to bring his bill forward at an early date. Prompt action is being urged by Secretary Lane and other Administration officials in the hope of obtaining without delay statutory authority under which to carry out the plan already set on foot by the Shipping Board, the Bureau of Mines, and the War Industries Board to release at least a dozen large steamers now engaged in bringing manganese, chromite, etc., to the United States. In view of the strong probability that the Foster bill will be enacted in the near future, the Government officials are experiencing difficulty in making further progress with voluntary agreements, although representatives of the iron and steel industry are now heartily co-operating in the attempt to thoroughly test the practicability of substituting Montana and other domestic manganese ores for the ores now imported from Brazil. W. L. C.

Alcohol and Loss of Time at a New York Blast Furnace

The question of prohibiting the manufacture and sale of alcoholic beverages has been brought directly to the attention of industrial managers by the votes taken or to be taken in the legislatures of various States and on the prohibition amendment to the Federal Constitution. In many cases managers have taken an active part in the State campaigns and not a few of them doubtless have made investigations as to the effect of the drinking habits of certain of their employees both upon plant production and the earning power of individual workers. From a statement prepared at the office of the Northern Iron Co. at Plattsburg, N. Y., the following is taken summarizing the results of investigations by the management at the company's blast furnace plant at Standish, N. Y.:

"We have selected a group of ten of our workmen who we know do not drink to excess, and ten who we know do drink to excess, to compare the regularity with which they work. For reasons which we will state later we use as a period of comparison the months of June and July, 1917. There were during this period 530 working days for ten men. We find that the group of employees addicted to the use of alcoholic beverages worked, during this period, 364 days, while the other group, who do not drink at all or drink only moderately, worked 534 days. In other words, the drinking group lost in working time 166 days, or approximately one-third of the time, while the other group worked slightly more than 100 per cent of the time, by working overtime.

"In selecting these groups, we selected men of like nationalities, or equal physical fitness, and those working at the same or similar work, to have our comparison as nearly parallel as possible.

"On the basis of this comparison, and assuming, as we believe it fair to assume, that each group represents 50 per cent of our employees, it appears that our workmen were losing at that time at least 16 per cent of the working time through the use of alcoholic beverages. It is also an undisputed fact that alcohol reduces the efficiency of workmen.

"We selected the months of June and July of last year for our comparison because at that time there was being shipped into the town where our plant is located large quantities of liquor, and we wanted our comparison to show the true effect of unrestricted liquor traffic. We believe, therefore, that the data thus obtained are fairly accurate and represent the conditions that exist at practically every operation in wet territory where industrial workmen are employed.

"We have made another comparison to demonstrate the effect of reducing the alcohol consumption by our workmen. In October, 1917, we employed watchmen, and since that time have undertaken to prevent the importation of alcoholic beverages into the town. We have compared the time worked by the wet group in the months of January and February of this year with the same time they worked in June and July of 1917. This comparison discloses the interesting fact that these same men in January and February of this year lost 55 per cent less time than they did in June and July of last year, notwithstanding the less favorable weather conditions during the first two months of this year. We can attribute this to no other cause than the partial exclusion of liquor from the town.

"We have made a further comparison to determine the effect of alcohol on industrial accidents. We find that during the period of June and July of last year there were 43 per cent more industrial accidents than were reported in January and February of this year."

Improved Method of Making Wrought Iron

A method for the manufacture of wrought iron is covered by a patent (U. S. 1,255,499—Feb. 5, 1918), granted to James Aston, of Pittsburgh, and assigned to the A. M. Byers Co. of that city. The patentee describes his process as follows:

Highly refined iron, produced by the Bessemer or open-hearth process, is disintegrated by any suitable milling operation that produces chips or shavings, and these chips or shavings are formed into a bundle and placed in a molten bath of silicate slag in an open-hearth or other suitable furnace, where the iron is allowed to remain until it has attained a welding heat. The bundle of iron with the adhering slag is then removed from the furnace and taken to the squeezer, where it is formed into blooms in the usual manner. Instead of forming the chips and shavings into bundles, they may be placed in the slag loosely, and after the iron has come to a welding heat it can be formed into a ball in the slag by means of a clam shovel or other suitable tool. Instead of chips and shavings of iron fagots may be formed of iron rods, into the interstices of which the slag will flow. Or, under certain conditions, the cold slag and the disintegrated iron may be placed on the hearth of the furnace together, as the heat required to bring the slag to a molten state will at the same time bring the iron to a welding heat or other forms of disintegrated iron may be employed. The iron may be brought to a welding heat before it is mingled with the slag. In certain cases other forms of slag may be desirable.

The advantages claimed are that the refining of the iron, which may be accomplished in large quantities by the Bessemer or open-hearth processes is separate from the operation which incorporates the silicate with the iron; and larger quantities of iron may be treated by the process in an open-hearth furnace at one heat than can be puddled. The result is a great saving in time and labor.

Construction work on the big Government depots to be built near New Cumberland, Pa., near Harrisburg, has been started. Six large warehouses for the quartermasters' department are to be built. Twenty additional railroad tracks from the Pennsylvania Railroad Co. lines will be laid.

COAL STORAGE IMPERATIVE

Fuel Administration Urges Manufacturers to Accumulate Coal and to Buy Now

BY J. D. A. MORROW*

To the makers of iron and steel and all readers of THE IRON AGE who are seeking to contribute 100 per cent effort to the winning of the war, I would bring home as emphatically as I can the necessity for doing two things:

1. Buy your coal now.
2. Accumulate as large a stock of coal as you can.

If this advice is followed there need be no repetition of the distress caused last winter by the coal shortage. If this is not done it is quite possible that next winter will find us with our lesson still unlearned.

The bituminous coal mines of the United States produced in 1917 approximately 544,000,000 tons. This was an increase over 1916 of about 8 per cent. A very large proportion of this 8 per cent increase was absorbed by the additional fuel coal requirements of the railroads. It has been estimated that 80 per cent of the increase was thus absorbed.

Coal production for the first quarter of 1918 just ended shows no increase whatever over production for the first quarter of 1917, while on the other hand there has been a noticeable expansion of all industrial activities. The Government is demanding iron and steel in quantities undreamed of before, and the elements that enter into their making are needed in much larger amounts.

It goes without saying that neither iron nor steel can be made without coal. The Fuel Administration, seeking to increase to the maximum the production of coal in 1918, has recently created a zone system of coal transportation under which long hauls of coal quite generally are eliminated. It is expected that this plan alone will result in an increased coal production of no less than 5 per cent. This assumes, however, that the transportation situation will be no more involved than it was last year. Looking ahead, it is not difficult to foresee a series of circumstances which would result in the suspension for days, even weeks at a time, of the major transportation facilities of the country so far as the movement of coal is concerned.

It is entirely possible that the Government will call upon the railroads, it may be without warning, to transport vast quantities of other materials; to clear the rails and give the right of way to troop trains; to rush supplies necessary for the proper maintenance of the Army or Navy, from one section of the country to another with all possible dispatch.

The severe storms of last winter also may be duplicated next winter, tying up and demoralizing the transportation lines of the country.

With all essential industries moving at full speed it is also quite conceivable that the railroads might again become disabled beneath an avalanche of freight other than coal, just as they were swamped in the winter of 1916-17 and in 1917-18.

Any of these contingencies might very easily result in the suspension for weeks of all coal movements. How then could the manufacturer of iron and steel continue his operations? There is only one way—by the accumulation of a sufficient stock of coal to tide him over such a possible period of transportation interruption.

The iron master and steel manufacturer, therefore, owe it to themselves and to the nation to see to it that so far as it lies within their power their fires shall not be banked. Store coal. If your storage facilities are not large enough to enable you to store enough coal to last you for a minimum, say, of six weeks, enlarge them. Get the coal during the next three or four months when the mines are best able to produce it and the railroads able to haul it and hold it against the day of its need.

Another element enters very largely into the situation. The coal mines of the country must be kept going steadily—not on half time or part time or closed down for days or weeks together—if the industrial requirements, so far as coal is concerned, are to be met. It will not do to wait until July or August to begin to store coal, for at that period the demand upon the mines and the railroads is in the ascendency. The time to store coal is now.

United States Fuel Administrator Garfield said the other day that it would be better to go to the bank and borrow money with which to buy coal now than to wait until it is too late to buy it at all. This advice applies to no one to quite such an extent as it applies to the industrial user of coal. The zone system of coal distribution put into effect by the Fuel Administration contemplates that all the mines shall be kept going all the time. If some of them are allowed to close down or slacken the whole machinery of distribution is thrown out of gear; the entire country suffers; and, as in the past, among the first to be hit is very apt to be the iron or steel maker.

*Manager of Apportionment and Distribution, United States Fuel Administration, Washington, D. C.

An Adjustable Stock Support

A new shop and factory accessory for supporting the free end of, say, a length of tubing being fed to a machine, such as a cutting-off machine, and intended to displace the makeshift block of wood with a gas pipe mounted on it, such as is often used, has been built by the A. F. Way Co., Inc., Hartford, Conn. It is now introduced on the market as the Loway adjustable stock support. It is quickly adjustable in height from 22 to 30 in., or, of course, for corresponding variations for greater height where the machines require it.

This Stand Adjustable as to Height Is for Holding Ends of Material Being Fed to a Machine

The stand is designed for use with hack saws, cutting-off machines, screw machines, band and circular saw machines, bolt cutters, thread milling machines, pipe-threading machines, etc. The cast-iron base is designed large enough to prevent tipping, and the roll at the top is shaped to carry various sizes and shapes of stock. As indicated in the accompanying illustration, the adjustment for height is obtained by a screw and nut, but the yoke supporting the roll will not turn around, so that it remains true in the direction of the passage of the stock.

Stockholm papers report that the Swedish Industrial Credit Institution and the well-known Uddeholm Company have applied for a concession to mine the newly discovered coal deposits at Billingen in West Gothland. The seams are very thin but with the present high prices of coal it will pay to work them, it is stated, especially so because the coal contains vanadium, which Sweden has hitherto been obliged to obtain abroad.

Savings on Rifle and Munitions Contracts

What Has Been Done in the Ordnance Department to Reduce Government Outlay on War Work—The Cost-Plus Plan

WASHINGTON, April 16.—The discussion in and out of Congress of the report of the British Committee on National Expenditures disclosing the fact that enormous profits have been made in Great Britain by munition manufacturers renders especially timely a concise statement of the methods pursued by the War Department in checking up the operations of munition manufacturers to prevent any form of profiteering even under contracts let on a cost-plus-profit basis. The care exercised by the Ordnance Bureau in protecting the interests of the Government in connection with the huge expenditures authorized by the Procurement Division under the direction of Col. Samuel McRoberts, will probably result in savings aggregating millions of dollars.

British Makers' Large Profits

The investigation made by the British Committee on National Expenditures, which embraced the operations of 26 firms manufacturing munitions selected at random, showed that in the aggregate these concerns made a profit five times greater than that which they would have made in normal times and that certain individual firms made profits as high as 341 per cent on their invested capital. In the case of other manufacturing operations closely supervised by the Government and made the subject of technical investigation very large savings were effected amounting in the case of gun ammunition to $175,000,000, and on gun equipment to $10,000,000. It has been made apparent, therefore, that close inspection and careful checking up combined with the necessary technical research to secure reliable data for comparative purposes have proven a great advantage in England. In the case of the United States War Department, however, these safeguards were employed from the start with the result that manufacturers have been limited to reasonable profits and the United States Army has secured a vast amount of material at lower prices than have been paid by the Allies notwithstanding the fact that requirements in the way of early deliveries have been more stringent in this country than abroad.

Enormous Contracts With Few Cost Data

When the United States entered the war it became necessary for the Ordnance Department to place orders for raw materials and equipment on a scale previously without precedent in the history of the world. Much of this material had never been manufactured in this country and therefore was not a standard product. The officials of the department were obliged to let enormous contracts before it was possible to ascertain the manufacturing cost and in some cases before the methods of production had been determined or the detailed design worked out. Under these conditions the only basis upon which agreements with manufacturers could be made was the so-called "cost-plus" contract. Manufacturers were unwilling to undertake the production of new articles at a flat price low enough to secure the approval of the contracting officers lest they should involve themselves in heavy losses. Owing to the enormous quantity of goods required a slight variation in the unit price of the article would involve millions of dollars; hence contractors refused to bid on such work on the basis commonly followed as to ordinary commercial products.

It is true that when the Government began buying ordnance material on a large scale much similar material had already been produced in this country for the Allies. Investigation, however, had satisfied the ordnance officials that in many cases the Allies had paid too liberal prices and as the War Department was determined to obtain full value for every dollar expended the data supplied by the Allies' contracts were rejected as not meeting the situation. In many instances speed was the essential consideration in view of the lack of preparedness in this country, and as is well known speed very often means uneconomical methods of manufacture. Because of this fact many manufacturers advised the department that they could not afford to produce articles at a normal cost where such early deliveries were required. It was necessary, however, that work be started at once, even as to certain material the exact design of which had not been decided upon, and this necessity was another powerful argument in favor of the cost-plus contract under which designs could be changed as necessary and much preliminary work done pending final adoption of the specifications.

The Cost-Plus Method on Rifle Work

Realizing that the cost-plus contract would provide a good or a bad basis according to the measure of safeguards provided for it and that extravagant expenditures might result unless the utmost vigilance should be observed, it was decided that all important items should be carefully checked by the Government. The care exercised in this connection may be illustrated in the checking of the cost and the methods of manufacture pursued in the plants engaged in turning out the modified Lee-Enfield rifle. The first step was to have verified by skilled accountants all expenditures for material, etc., and no invoices were paid by the Government without the approval of the accountants. The prices paid for material were checked against the schedule provided by the War Industries Board representing agreements with the steel manufacturers which had received the President's approval. A staff of manufacturing cost experts was then organized and assigned to duty at the various plants after the methods whereby the cost of the various components making up the rifle should be obtained had been carefully standardized. In this way data were obtained not only for determining the total cost of the rifles but also for comparing the various factors of cost at the various plants.

A weekly report is received in Washington from each of the three plants making rifles showing the wages paid all classifications of labor and the average weekly wage paid. For example, for the week ending Feb. 23 the average of weekly wages paid was $22.74. This includes all employees from the unskilled laborer to the general superintendent.

Amount of Scrap Kept Down

A detail of production to which special attention has been devoted is the amount of scrap made in connection with the output of rifles. Weekly reports of the scrap produced have been made and manufacturing methods have been investigated with a view to reducing it to the smallest possible limit. It is confidently believed that the scrap in the rifle plants is lower at the present time than in that of the great majority of manufacturing establishments operating on a similar class of work. Similar methods are employed in checking the tool cost of the rifle. This is an important feature of the work and the care with which this branch of the supervision has been carried on has been largely instrumental in bringing about very satisfactory results. Overhead or non-productive labor cost has received special attention and has been closely checked up in order to keep it at a minimum figure.

Inspection of Manufacturing Methods

With a view to insuring the adoption of the most economical methods of production in the several rifle plants, method inspection work was instituted. Experts

in manufacturing were obtained and stationed at the plants. Detailed studies of the operations on each component were made and submitted to the department with recommendations prepared by these methods inspectors. The methods employed and the various recommendations have been carefully compared and where it appeared that savings could be made the manufacturers were instructed to institute at once the necessary changes with a view to standardizing the practice throughout all the rifle-making establishments.

As illustrating this procedure there may be cited the butt plate spring which is a very small item in the production of the military rifle. The officer detailed by the Procurement Division of the Ordnance Department to the plant in question makes a detailed report, including a blue print giving the dimensions of the finished spring and followed by a list of all the operations through which this small part must pass before being assembled in the rifle. This part is subject to nine operations including annealing, stamping, reaming out screw holes, tempering the spring, stiffening, testing, etc. Then follows a specification of the quality of the steel and the analysis of the metal; a concise report of the methods pursued in performing the nine operations necessary to finish the item, blue prints of the stamping machinery necessary for producing the part; an estimate of the cost of the machinery; a calculation of the estimated wear on the machinery; the approximate average output per man and the cost per hour for labor. All these items are brought together in a summary in which is stated the actual cost of the finished part. By this careful system of following up the work standardizing methods of production and checking of items of cost, it is estimated that savings in the neighborhood of $500,000 on the rifle contracts have been effected.

Saving of $13 per Rifle

When the matter of the placing of rifle contracts was first taken up at the beginning of the war the rifle companies considered that a fair price for the weapon as designed would be from $35 to $40 each. They had undertaken to manufacture the original Lee-Enfield for the British Government at the flat price of $30 and each of the companies had been obliged to surrender their contracts after losing very large amounts and demonstrating conclusively that the rifle could not be made at a profit at the contract price. It therefore seemed reasonable that they must receive $35 to $40 in order to make any profit. Nevertheless, at the present time it is costing to manufacture the rifle about $22. This figure represents the manufacturing cost and does not include Government inspection expenses or War Department overhead, but in this connection it should be remembered that the modified Lee-Enfield rifle now being made for the United States Army is a great improvement over the original British weapon both in design and finish. If the contracts with the manufacturers had been entered into at $35, the minimum price discussed at the outset, the rifles would be costing the United States $13 each more than at the present time; hence on an output of 1,000,000 rifles an economy has been effected of $13,000,000.

Another illustration of close figuring by the Ordnance Department is found in the loading of artillery ammunition. It is a well known fact that before the United States entered the war large quantities of explosives and shells had been made for the Allies but practically no loading and assembling of the complete shells had been done in this country with the exception of a few firms who had operated on a moderate scale on small size shells for the Russian and French Governments. To all intents and purposes it was a new branch of work and in most cases factories had to be built for the purpose. The practice is for the Government to buy the shell casings, fuses, boosters, and explosives from their respective manufacturers and ship them to the loading plants to be assembled. Due to the traffic conditions prevailing during the past winter supplies were frequently long overdue when received at the loading plants. If one part should be missing of course the entire work must be held up. It is indicative of the low margin of profit on which these contracts were placed that solely because of the delay in receiving materials when required the books of the contractors probably show a debit rather than a net profit up to March 1.

The cost-plus contract, it is frankly admitted here, is open to criticism unless it is carefully guarded but if the Government's interests are adequately protected by proper inspection and cost accounting systems the officials believe that this type of agreement is the most economical and decidedly the fairest to both the contractor and the Government in view of the extraordinary conditions encountered in the present great emergency. W. L. C.

Unit Design of Rack for Tote Boxes

A rack is now being built by the New Britain Machine Co., New Britain, Conn., for holding the tote boxes put on the market some time ago by this company. It is of unit design to make it adaptable to various requirements for the storage of small parts for the assembling room as well as the stock room. The front uprights are flat steel; those at the rear are angles. Angle runners on which the boxes slide are electrically welded to each pair of uprights. The welded members are connected by cross ties at the front, while the back is closed in and stiffened by sheets bolted to the angle uprights.

The New Britain Machine Co. Has Brought Out a Sectional System of Racks for Holding Tote Boxes

With standard units the racks may of course be expanded horizontally to any extent and on special order may be built to accommodate a greater number of boxes in each tier. When a box is hauled out and is permitted to sag, the raised rear end comes in contact with the front cross tie, allowing loading or unloading in this exposed position without danger of the box sliding out. The rack may be shipped in knocked down form, and in that case the company provides suggestions as to the procedure to follow in erecting the rack. It is built to accommodate 16 x 10 x 5-in. and 20 x 12 x 6-in. boxes.

A long-distance motor truck delivery service has been instituted by the Syracuse Smelting Works from its plant in Brooklyn, N. Y. For this a 5-ton Packard truck is being used, making a trip between Philadelphia and Brooklyn one way each night. A crew of three chauffeurs is carried, who alternate at driving and resting.

Copper Castings for Electrical Purposes*

Use of Silicon as a Deoxidizer Insures Maximum Electrical Conductivity—Effect of Other Elements

BY G. F. COMSTOCK

IT is only within the last 50 years that the refining of copper has become so efficient as to make possible the transmission of power by electricity with negligible losses due to resistance. Before 1860 the resistance of the usual grades of copper, even in the form of wire, was only about 50 per cent of the standard which we have to-day. Then Matthiessen brought out his classic work on the electrical conductivity of alloys, including the paper "On the Effect of the Presence of the Metals and Metalloids Upon the Electric Conducting Power of Pure Copper," published in "Philosophical Transactions," 1860, pp. 85 to 92.

Effect of Impurities on Conductivity

Matthiessen emphasized the importance of eliminating all possible traces of impurities from copper to be used for conducting electricity. For instance, he found the conductivity of copper with 1.6 per cent zinc to be only about 79 per cent of that of pure copper, both being in the form of wire; with 1.3 per cent tin it was decreased to about 50 per cent, with 0.1 per cent aluminum to 76.5 per cent, with 0.5 per cent iron to 36 per cent, while only 0.13 per cent phosphorus decreased the conductivity to 70 per cent, and even traces of arsenic, to 60 per cent.

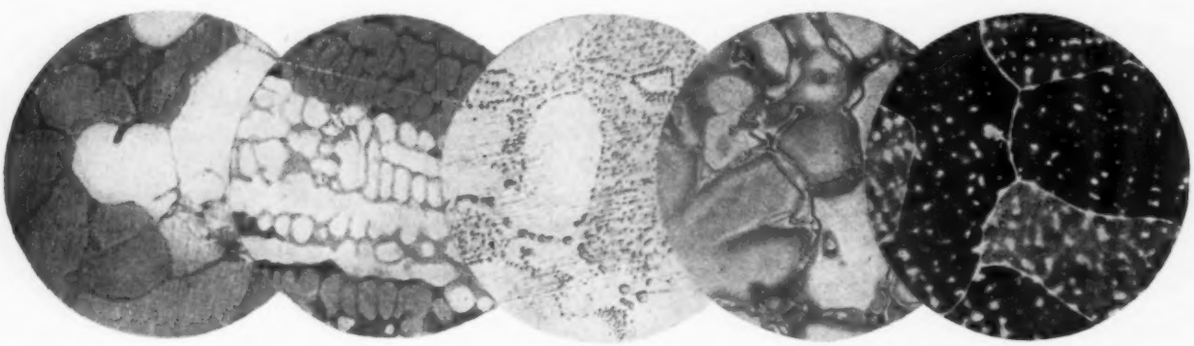
The publication of these results had considerable influence in encouraging progress in the direction of more complete purification of copper in refineries, and soon the conductivity of the average copper wire turned out for electrical uses rose from around 50 per cent to about 98 per cent of the figure which copper should attain. At the present time it is unusual for standard copper wires to run much below 100 per cent in conductivity, this figure meaning that a wire one meter long and of such diameter as to weigh one gram, has a resistance of 0.15328 ohm at 20 deg. C.

Before passing to the consideration of castings, which really form the subject of this paper, it is desired to make a brief reference to the work of Lawrence Addicks on the conductivity of various grades of copper. A paper by him was published in the *Transactions* of the American Institute of Mining Engineers, Vol. XXXVI (1906), page 18, on "The Effect of Impurities on the Electrical Conductivity of Commercial Copper," in which he gives the relative decrease in conductivity per unit of impurity added for 16 of the more common impurities in copper wire. This factor of decrease in conductivity per unit addition is thus 720 for arsenic, 600 for phosphorus, 500 for aluminum, 140 for iron, 70 for silicon, 67 for tin, 30 for zinc, 25 for oxygen and 3 for lead. The above ratios are intended to apply only to small decreases in conductivity, or to very small additions of the respective elements.

Condition of the Metal as Castings

Since it is known that, in order to get copper wires of high conductivity, it is necessary only to start with extremely pure copper bars, it might seem a simple matter to secure all kinds of copper castings of equally good conductivity by the same means, or merely by using pure copper. But two difficulties are encountered when this is attempted; first, sound castings are almost an impossibility, and second, the pure metal in the cast condition is too soft and weak to give the best satisfaction in most electrical uses.

The difficulty of obtaining sound castings of pure copper is caused by its rapid absorption of oxygen and other gases when it is melted. The gases not only dissolve in the molten metal but copper oxide is also formed, which is held in solution until the metal freezes. When a casting is poured, the gases are evolved from the cooling copper forming blow-holes, and the oxide comes out of solution forming films of a copper-oxide eutectic between the grains of metal. These films and gas holes naturally impair the electrical conductivity of a casting as well as weaken it mechanically, because of the presence of less pure copper in a given cross-section. Casting in a cold metal mold, which chills the copper very fast, reduces the severity of the unsoundness due to gas holes, but most castings by reason of complicated form must be cast in sand to make their production financially practicable.



Photomicrographs of Copper, All Reduced About One-Half from the Original. Fig. 1 (left to right) shows the structures of pure electrolytic copper, original diameter 100. Fig. 2 represents copper carelessly melted and badly oxidized. Fig. 3 is copper with an abundance of oxide, taken before etching, original diameter 400. Fig. 4 is copper heated with phosphorus, original diameter 100. Fig. 5 represents copper deoxidized and hardened by about 4 per cent of zinc. All specimens except Fig. 3 were etched with ammonia and hydrogen peroxide

The second difficulty with pure copper castings, that of softness and weakness, cannot be overcome except by adding some other metal to the copper, thus making it no longer pure, or by giving the casting some mechanical treatment such as forging, after which it is, properly speaking, no longer a casting. Where cast copper has a strength of only 20,000 lb. per sq. in. (14 kg. per sq. mm.) and a Brinell hardness of about 35, small bars of the same material after forging may have a strength of 35,000 lb. per sq. in. (24.5 kg. per sq. mm.) and a Brinell hardness of 70.

Adding Zinc to Copper Castings

Foundrymen called upon to make castings of copper for electrical uses have in the past generally added an impurity intentionally for the purpose of deoxida-

*From a paper prepared for the October, 1917, convention of the American Electrochemical Society but not presented. The author is metallurgist, Titanium Alloy Mfg. Co., Niagara Falls, N. Y.

tion, and have thus raised the hardness and strength of their castings, although at the expense of more or less conductivity. Zinc was the element most often used, and with its aid sound castings could be produced fairly easily with the minimum reduction of conductivity (as can be seen by referring to Matthiessen's and Addicks' data for wires quoted above). Of course, such castings deoxidized by zinc had a considerably lower conductivity than copper wire, running only about 40 to 50 per cent in many cases. The necessity of sacrificing conductivity for the sake of soundness in the case of copper castings seems to have been recognized by electrical engineers, who designed the cast connections of important conductors with generous cross-sections to prevent heating.

A better deoxidizer, which would give the same soundness obtained by zinc but without reducing the conductivity so much, is, of course, much to be desired, as it would allow a casting of less weight to carry with equal ease any given amount of current. To this end phosphorus and silicon have both been used in place of zinc, but while very small quantities of either are normally sufficient, their use is attended by the disadvantage that an excess of either of these elements does more harm to the conductivity than an equal excess of zinc. This objection applies with more force to phosphorus than to silicon. Boron has lately been used with success as a deoxidizer for copper, but its use is attended with considerable expense because of the difficulty of reducing this element to a form in which it is effective.

Silicon as a Deoxidizer

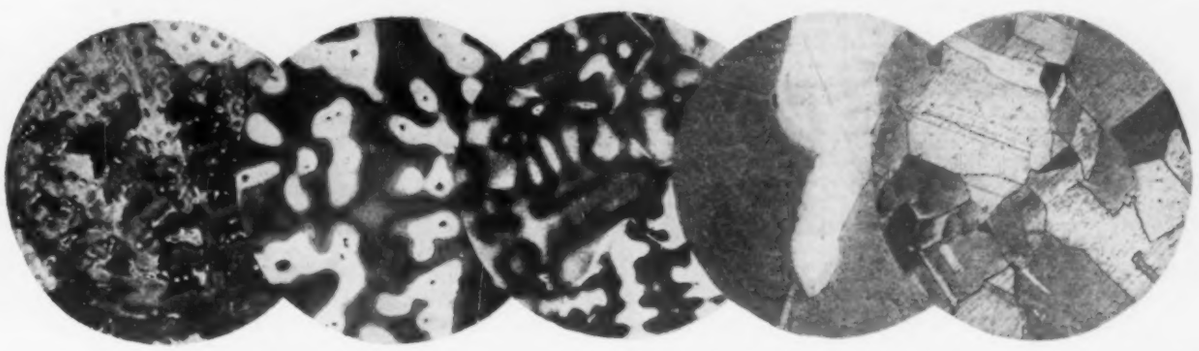
The problem of a superior deoxidizer for copper has received serious study in the experimental department of the Titanium Alloy Mfg. Co. for several years, with the result that a method of using silicon as a deoxidizer for copper has been found which makes the most of the superiority of this element over zinc, and at the same time minimizes the bad effect of the small excess of deoxidizer which cannot always be avoided. Of course, careful melting of the copper, to prevent as much oxidation or absorption of gas as possible, is an important part of this process.

The first step, then, is to melt the metal quickly and in as non-oxidizing an atmosphere as possible, keeping it well covered with charcoal at all times. A small amount of silicon is added before pouring, in the form of a flux which we have developed and which acts in such a way that the excess of silicon and oxides of silicon are thrown out of the metal to the surface of the casting, leaving the interior pure and clean. In this way we have been able to make complicated and large sand-castings of pure copper having 75 to 85 per cent conductivity, as compared with the 40 to 50 per cent generally obtained on copper castings deoxidized by zinc. This material naturally is soft and weak, and so far we have found no way to harden it except by forging. But we are still working along these lines, and hope to evolve an alloy which will make harder, stronger castings of equally good conductivity.

A few photomicrographs illustrate the structeures of a few samples of copper made in different ways. These specimens were examined in connection with the research to develop a satisfactory deoxidizer for copper. Fig. 1 shows the structure of a small ingot of especially pure electrolytic copper magnified 100 diameters. A section of the metal was carefully polished to remove all but the finest scratches from the surface, which was then treated with a mixture of strong ammonia and hydrogen peroxide until it was rather deeply corroded. This etching reagent attacks the copper crystals with different intensities, so that some appear darker than others after etching. Impurities are shown either by dark streaks between the grains or by more or less regular markings within the grains. In this case there are no markings within the crystals, showing the absence of dissolved impurities, but there are dark streaks between the copper grains due to the presence of a little copper oxide.

Fig. 2 shows a sample of copper which was carelessly melted and badly oxidized. An excessive amount of oxide is here indicated by the dark bands between and within the grains of pure copper. Fig. 3 is a view taken at a higher magnification (400 diameters), and before etching, of copper with an abundance of oxide. The drop-like particles are blue copper-oxide, and the background in which they appear is pure copper. The clear areas of this view are thus the copper grains, and the spotted areas are what is known as a eutectic, or mixture, of copper and copper-oxide. It is thus eutectic which is strongly attacked in etching, giving dark bands around the copper grains, and it is evident from this view that a very small amound of oxygen, present as tiny globules of Cu_2O, will form an appreciable amount of the eutectic, as was the case in the pure copper shown in Fig. 1.

Fig. 4 shows a sample of copper treated with phosphorus, etched as explained above, and magnified 100 diameters. The copper grains are seen to have etched dark around their edges, showing the presence of phosphorus in solution, and there are streaks of oxides between the grains. Fig. 5 shows some copper deoxidized and hardened by about 4 per cent of zinc. This metal is sound and free from dirt or oxides, but the crystals show rows of light spots indicating an impurity (zinc) in solution. This view was magnified only 20 diameters.



Photomicrographs of Copper, All Reduced About One-Half from the Original. Fig. 6 (left to right) is very impure cast copper with traces of lead, tin and iron, original diameter 20. Fig. 7 is a similar impure sample containing arsenic, original diameter 100. Fig. 8 is copper deoxidized with an excess of silicon, original diameter 50. Fig. 9 is pure cast copper with 75 to 85 per cent electric conductivity. Fig. 10 is the same after hardening by forging. All specimens were etched with ammonia and hydrogen peroxide

Fig. 6, also magnified 20 diameters, shows some very impure cast copper, with traces of lead, tin and iron, as well as considerable zinc, and the unevenness of structure is very evident. Fig. 7 shows a similar impure sample containing a little arsenic, but magnified 100 diameters instead of 20.

Fig. 8 shows the structure of copper deoxidized with an excess of silicon, magnified 50 diameters. The patterns in the crystals are very distinct here, but the metal is sound and free from oxides. Fig. 9 shows a sample of the purest cast copper which we have been able to make, which is sound and clean and runs from 75 to 85 per cent in conductivity. Only very few traces of oxides are present here in the form of black specks, and the purity of the copper is shown by the freedom from any light and dark patterns within the crystals. Fig. 10 shows this same copper after being hardened

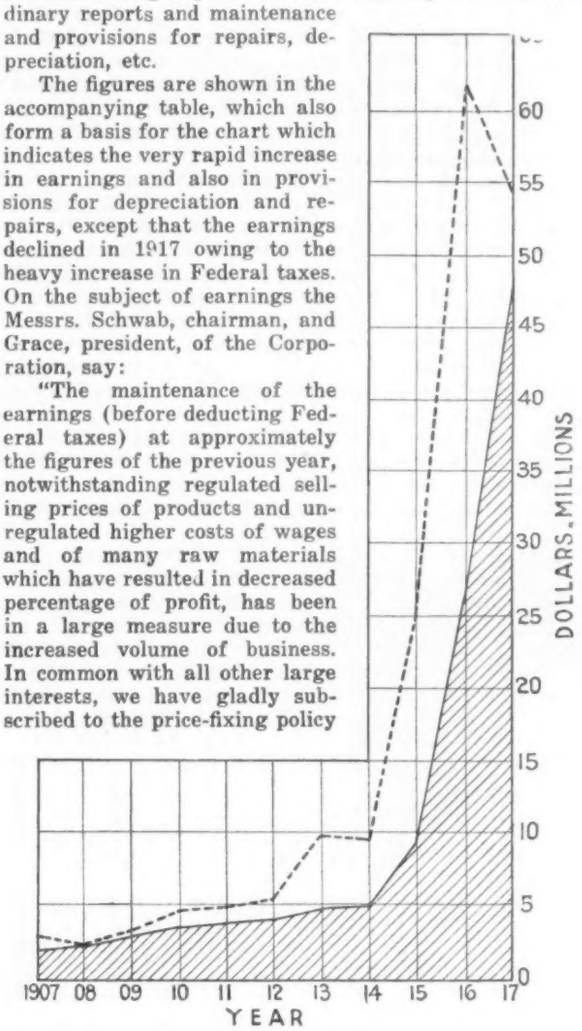
by forging, the crystals having been broken up into finer grains, but without oxidation or loss of purity or conductivity. All the views except Fig. 10 were of cast copper, and all except Fig. 3 show copper etched with ammonia and hydrogen peroxide. All except Nos. 3, 5, 6 and 8 were taken at a magnification of 100 diameters.

Bethlehem Steel Earnings

The thirteenth annual report of the Bethlehem Steel Corporation, to which reference was made in a recent issue of THE IRON AGE, contains a very interesting statement in regard to the net earnings from operations after deducting expenditures for ordinary and extraordinary reports and maintenance and provisions for repairs, depreciation, etc.

The figures are shown in the accompanying table, which also form a basis for the chart which indicates the very rapid increase in earnings and also in provisions for depreciation and repairs, except that the earnings declined in 1917 owing to the heavy increase in Federal taxes. On the subject of earnings the Messrs. Schwab, chairman, and Grace, president, of the Corporation, say:

"The maintenance of the earnings (before deducting Federal taxes) at approximately the figures of the previous year, notwithstanding regulated selling prices of products and unregulated higher costs of wages and of many raw materials which have resulted in decreased percentage of profit, has been in a large measure due to the increased volume of business. In common with all other large interests, we have gladly subscribed to the price-fixing policy adopted by the Government; and, while many inequalities exist in the application of the details of the policy, we are hopeful that they will eventually be adjusted. The adoption by the Government of the 'cost plus' and 'cost and fee' methods of determining the contract price has presented difficulties in application and interpretation, but they have not been permitted to delay the progress of the work in hand."



Dotted line shows net earnings and unbroken line shows total provisions for repairs, depreciation, etc.

Year	Earnings	Depreciation and Repairs
1917	$53,979,360	$47,284,855
1916	61,717,309	26,848,772
1915	24,821,408	9,106,671
1914	9,649,667	4,716,273
1913	8,752,671	4,532,097
1912	5,114,439	3,759,599
1911	4,792,713	3,525,237
1910	4,524,141	3,261,760
1909	2,993,536	2,809,639
1908	2,196,172	2,209,876
1907	2,642,178	1,802,114

Sloss-Sheffield Earnings

Sloss-Sheffield Steel & Iron Co. has issued its pamphlet report for the calendar year ended Dec. 31, 1917. The income account covers operations for 13 months, by reason of a change in the company's fiscal year from Nov. 30 to the calendar year. Comparison of the income account for the 13 months with years ended Nov. 30, 1916, 1915 and 1914, follows:

	1917	1916	1915	1914
Oper. profit	$3,370,614	$2,230,000	$732,388	$700,139
Interest	227,500	239,325	210,000	210,000
Depreciation and depletion	665,741	.....	.....	.....
War taxes	325,000	.....	.....	.....
Balance	*$2,152,373	$1,990,675	$522,388	$490,139
Preferred dividends	573,881	469,000	351,750	469,000
Common dividends	148,869	.....	.....	.....
Surplus	$1,429,623	$1,521,675	$170,638	$21,139

*The annual report covers thirteen months' period. There has been deducted from earnings of that period five quarterly preferred dividends of 1¾ per cent each, amounting to $573,881.

President McQueen, in his statement to stockholders, says:

"The past year has been one presenting extreme difficulties in your company's operations. Interruptions in transportation made it impossible for the company to ship large quantities of pig iron on hand which had been sold and which was urgently demanded by the buyers. Other conditions affected operations in a marked way.

"All your company's blast furnaces and developed mines were, notwithstanding traffic interruptions and other adverse operative conditions during the year, in effective operation and are now in full operation and producing to the maximum of output under the present development of properties and plants. It must be anticipated, however, that costs of production will increase owing to labor and material conditions. The demand for pig iron exceeds the supply. Your sales are being made at the price fixed by the Government.

"The outlook, notwithstanding the uncertain conditions existing throughout the year, seems to be favorable and your company should enjoy a good business for the ensuing year."

American Rolling Mill Stock

The stock of the American Rolling Mill Co., Middletown, Ohio, has been listed on the Pittsburgh Stock Exchange. The company operated an open-hearth steel works and finishing mills at Middletown, Ohio, largely in the manufacture of American ingot iron, and last year took over two blast furnaces of the Columbus Iron & Steel Co. at Columbus, Ohio, in order to have its own supply of pig iron. The authorized capital of the American Rolling Mill Co. is $21,500,000 of which $9,441,075 common and $1,300,000 preferred stock is outstanding. In addition it has authorized $2,500,000 in 6 per cent gold notes, of which $1,166,500 are outstanding. The par of the common stock is $25 a share, on which dividends of 20 per cent per annum are being paid. The par of the preferred stock is $100 a share. It is 6 per cent cumulative as to dividends and preferred as to assets. At intervals since 1905, the company has paid stock dividends on the common stock ranging from 5 to 33 1/3 per cent, the rate of such dividend this year being 5 per cent. Net income for the fiscal year ended June 30, 1917, was $3,951,512 against $3,141,687 in 1916, and $753,370 in 1915. The balance sheet as of Dec. 31, 1917, showed total surplus of $13,012,577, and total assets of $35,711,348. The officers of the company are: George M. Verity, president, J. H. Frantz, vice-president, G. H. Charles, R. B. Carnahan, Jr., and C. R. Cook, vice-presidents, R. C. Phillips, secretary; N. W. Collard, treasurer, and C. W. Davis, assistant treasurer.

The universal plate mill at the steel works of the Mark Mfg. Co., Indiana Harbor, Ind., rolled its first steel April 3, making the third rolling mill placed in operation at a plant where, a year ago, fish swam.

NEW PREFERENCE LIST

Numerous Plants Connected with Iron and Steel Manufacture Included

WASHINGTON, April 16.—To provide for the preferential distribution by rail and water of coal and coke, with a view to insuring adequate supplies for those industries contributing directly to the prosecution of the war, the War Industries Board has adopted a category known as Preference List No. 1, for the guidance of all Governmental agencies. While the list speaks for itself, it is officially stated that the board has not undertaken to classify any industry as nonessential or at this time to limit the quantity of fuel which any particular industry or plant shall receive. The board has, however, listed certain industries whose operation is of exceptional importance measured by the extent of their direct or indirect contribution either toward winning the war or toward promoting the National welfare, and these industries will be accorded preferential treatment by the fuel administration in the distribution of coal and coke, and also in the transportation of such coal and coke by the railroads.

This same plan will be followed in according preferential treatment to war industries and plants in the transportation of raw materials and supplies required by them in their manufacturing operations, so that they may not be delayed or hampered in complying with priority orders issued against them governing their products.

Preference List No. 1 is not complete in itself, but provision is made for certifying additional classes of industries and also individual plants the operations of which are necessary as a war measure. In determining what industries or plants are entitled to be certified two factors will control: (1) The relative urgency of the uses or purposes for which the product of the plant is utilized, and (2) the per cent of the product of the plant utilized in war work, direct or indirect, or work of exceptional or National importance. No plant, a very substantial per cent of whose product is not of exceptional importance, can be accorded preferential treatment.

The preference list contains the following items directly or indirectly connected with iron, steel and machinery:

Aircraft: Plants engaged exclusively in manufacturing aircraft or supplies and equipment therefor.

Ammunition: Plants engaged in the manufacture of ammunition for the United States Government and the Allies.

Army and navy cantonments and camps.

Arms, small: Plants engaged in manufacturing small arms for United States Government and for the Allies.

Coke plants.

Electrical equipment: Plants manufacturing same.

Electrodes: Plants producing electrodes.

Explosives: Plants manufacturing explosives.

Farm implements: Manufacturers exclusively of agricultural implements and farm operating equipment.

Ferroalloys: Plants producing.

Fire brick: Plants producing exclusively.

Food containers: Manufacturers of tin and glass containers and manufacturers exclusively of other food containers.

Gas: Gas producing plants.

Gas: Plants manufacturing exclusively gas producing machinery.

Guns, large: Plants manufacturing same.

Iron and steel: Blast furnaces and foundries.

Machine tools: Plants manufacturing machine tools.

Mines.

Mines: Plants engaged exclusively in manufacturing mining tools and equipment.

Newspapers and periodicals: Plants printing and publishing exclusively newspapers and periodicals.

Oils: Refineries of both mineral and vegetable oils.

Oil production: Plants manufacturing exclusively oil well equipment.

Public utilities.

Railways.

Railways: Plants manufacturing locomotives, freight cars and rails, and other plants engaged exclusively in manufacture of railway supplies.

Ships (bunker coal): Not including pleasure craft.

Ships: Plants engaged exclusively in building ships (not including pleasure craft) or in manufacturing exclusively supplies and equipment therefor.

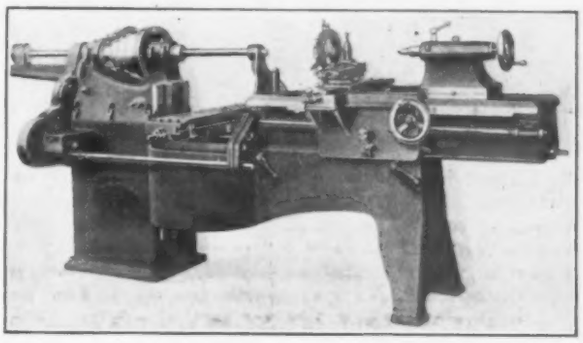
Steel: Steel plants and rolling mills.

Tin plate: Manufacturers of tin plate.

Wire rope and rope wire: Manufacturers of same.

A Combination Metal-Working Machine

All of the facilities provided on a 16-in. lathe of the sliding bed gap type, a horizontal boring mill and a plain milling machine are said to be provided by a combination metal-working machine that is being built



Work That Would Ordinarily Be Taken Care of by a Gap Lathe, Horizontal Boring Mill or a Plain Milling Machine Can Be Handled in a New Combination Metal Working Machine

by the George W. Fleming Co., Springfield, Mass. In this way, it is emphasized, turning, milling and boring operations can be performed on a single machine, each unit when in use being operated precisely the same as if it were an independent machine.

The sliding member is carried by a ribbed base, and it is also supported by the milling machine table when the sliding bed is in the closed position. This arrangement is relied upon to give a vibrationless support for the bed and enable heavy work to be done. This bed, like its supporting base, is ribbed, and the ways are carefully scraped with a view to securing accurate alignment of the spindle for both the carriage and the tailstock. The carriage has a bridge on the end adjacent to the headstock and extends over the face of the apron. In this way it is possible for the compound rest to be used up to the full swing of 25 in. when work which necessitates the employment of the gap lathe arrangement is being handled. A four-step cone pulley and single back gears are employed for driving the headstock, which has a hollow spindle provided with means for taking up lateral and radial wear.

All of the sliding surfaces of the milling machine table, saddle and knees are scraped with a view to securing accurate fits. Helical gears and a screw operated by a crank on the face of the column control the elevation of the milling machine table.

The boring mill is of the platen and table type. It is designed to use a boring bar 1½ in. in diameter. Power feed is provided for the bar, the lathe change gears supplying the power for this feed.

The equipment regularly furnished is such as ordinarily supplied for the different machines in the combination, and special equipment can be supplied at additional cost.

Falkenburg & Co., Seattle, recently opened a new laboratory in that city equipped with a 2,000 capacity Riegle testing machine, to be used in testing steel bars for shipbuilding firms of the Northwest. The company recently installed a new organic laboratory and an improved assay furnace which can be used in testing and refining rare metals.

The plant of the Watson-Frye Co., Bath, Me., was destroyed by fire April 6, with a loss of $75,000. The company made brass castings for the Emergency Fleet Corporation and machinery for paper pulp mills.

Standard Specifications for Castings

Steel Founders' Society of America Urges a Revision of Existing Rules and Practice—Recommends Adoption of the Testing Society's Rules

IN order to expedite the production of steel castings for the Government and also at the same time to bring about a standardization of the specifications, the Steel Founders' Society of America, as a result of a meeting held Jan. 4, appointed a committee to investigate the matter of specifications and inspection and to obtain the recommendations and suggestions of various producers. Based on its deliberations and on replies received from steel foundrymen, the committee has formulated the following recommendations:

Chemical Analysis

The revision of specifications permitting the sulphur content of castings manufactured by the converter process to contain a maximum of 0.08 per cent sulphur and 0.07 per cent in phosphorus, and an increase in the permitted sulphur content of castings manufactured by the open-hearth process to 0.06 per cent in phosphorus and 0.06 per cent in sulphur. This is necessary because it is now impossible to secure suitable raw material and fuel, and the manufacturers are unable to guarantee a lower phosphorus and sulphur than that indicated. Most of the purchasers of steel castings, including the large railroads of the country and some departments of the Government have already agreed to these increases in whole or in part, recognizing that the difficulties the manufacturers experience are due to causes beyond their control. It should be explicitly specified that when these revisions are adopted, they should apply to contracts or orders which have already been placed under the old specifications, but which have not yet been filled.

Castings Tested Individually

One of the greatest differences between the requirements for Government castings and commercial castings is in the number of test bars required. It is the opinion of the committee that, insofar as possible, heat tests rather than individual tests should be used so as to cut down the number of tests for each heat. The testing of castings individually is of no advantage to the purchaser as there is no material difference in the test results secured from test bars from different castings in the same heat.

The only possible difference would be the result of annealing. It is, therefore, recommended that, if more than one heat is represented in an annealing charge, one tension and one bend test shall be made from each heat. The annealing shall be determined by the use of annealing test lugs which should be attached to important castings when specified in advance, and may be broken off by the inspector for examination of the grain. The annealing lugs referred to shall consist of small pyramids approximately ½-in. square at the base and approximately 1-in. high, which can readily be removed with a hand hammer, and give a complete indication of the annealing of the castings.

The committee recommends that the wording of the specifications of the American Society for Testing Materials covering the number of tests required, and the placing of test bars on castings, and the method of casting unattached bars be generally adopted, as this has been found clear and concise, and has met the approval of the purchasers and manufacturers. This should be supplemented with a clause covering annealing test lugs about as follows:

> Annealing test lugs of approximately ½ in. section, shall be attached when specified in advance to castings, which may be removed by the inspector to ascertain whether or not the annealing has been properly carried out.

It is the opinion of the committee that the adoption of this recommendation would greatly reduce the number of test bars required on Government work, and would assist in putting the production of Government castings on the same basis as castings for commercial purposes.

Central Inspection Bureau

The recommendation most generally made, by the various manufacturers, to the committee was that a central inspection bureau be established that could handle the inspection for all branches of the Govern-

Grade	Tensile Strength, Lb. per Sq. In.	Elastic Limit, Lb. per Sq. Ft. or Percentage	Elongation	Reduction of Area
Army, No. 1	60,000	25,000	16	24
Navy, B	60,000	45%	22	30
A. S. T. M., soft	60,000	45%	22	30
Army, No. 2	75,000	35,000	15	20
Navy, D	70,000	45%	22	30
A. S. T. M., medium	70,000	45%	18	25
Army, No. 3	85,000	45,000	12	18
Navy, A	80,000	45%	17	20
A. S. T. M., hard	80,000	45%	15	20

ment. This plan, if carried out, would make it possible for the Government to handle this inspection with less men and enable them to have inspectors, trained in inspecting steel castings, devote their entire time to this class of material. In addition to saving salary and traveling expenses of the inspectors, it would be greatly to the advantage of the Government and the manufacturer to have experienced men devote their entire time to this work, who would be able because of their experience to exercise discretionary powers not now possible. It has been the experience of all foundries that many cases arise in which castings meet the spirit, but vary in some details with the letter of the specifications. An inexperienced inspector, or one without proper discernment, insists on castings meeting the letter of the specifications, resulting in delays and many rejections of castings that are perfectly suited to the purposes for which they are intended. The establishment of a central inspection bureau would make it possible to have direct communication with those in authority so that questions could be passed upon immediately, and thus save the delay of holding castings until the communication goes through roundabout channels.

The British Government found it desirable to combine under one head their inspection forces consisting of Lloyd's, the Admiralty Steel Department and the department devoted to the supplying of steel for munitions, and further expedited the inspection by restricting it to samples instead of going into detailed examinations.

General Specifications

To establish a central inspection bureau it would be necessary to have the various departments of the Government adopt a single set of specifications, so that the same rules would govern the inspection and that the chemical and physical requirements would be uniform.

It is the recommendation of the committee that every possible effort be made to have the various departments of the Government adopt the essential details, if not the entire specifications, of the American Society for Testing Materials, omitting Section VII, as their standard. In view of the fact that these specifications have been devised by a technical body made up of engineers, producers and purchasers of steel castings and have been found after years of practical use to be practical and efficient, the committee does not hesitate to make this recommendation.

Physical Requirements

Grades 1, 2 and 3 of the Army specifications are very similar to grades B, D and A of the Navy speci-

fications, and there is but little difference between them and the three grades covered by the specifications of the American Society for Testing Materials, as will be noted from the table on the preceding page.

It will be noted that in the Navy and A. S. T. M. specifications the yield point is expressed in the terms of the tensile strength, which in the opinion of the committee is proper. The committee recommends that an effort be made to have the Army and Navy accept the rules of the American Society for Testing Materials as standards for grades 1, 2 and 3 of the Army and B, D and A of the Navy, and another grade to correspond to grade F of the Navy be added.

Number of Inspections

Most of the foundries complain of the number of inspections necessary under Government specifications, which leads the committee to suggest that the inspection of Government castings should be brought to conform to the inspection of commercial castings in order to save time and increase the production.

Government specifications are so applied that it is impossible to produce steel castings at anything like the same cost or quantity as steel castings subject to commercial specifications and inspection because of so much handling in the cleaning and finishing departments. This applies particularly to an inspection of castings in the green. This is not commercial practice, and it congests the shops on account of unavoidable delays waiting for inspectors and extra crane service. This preliminary inspection seems unnecessary, as final acceptance of the castings is generally made in the machine shop. One trip of the inspectors could be saved by identifying the test bars by matching the break instead of having the inspector stamp the bars before they are removed from the castings.

Testing Machines

There should be uniformity between the various departments of the Government covering the calibration of testing machines. At the present time a machine that has been calibrated may be acceptable to one department of the Government whereas another department may demand a separate calibration. The expense of having machines calibrated is considerable, and one calibration by a standard laboratory should be acceptable to all departments of the Government.

Location of Test Bars

Specifications should be so worded that the location of test bars and the method of attaching bars should be left to the judgment of the manufacturer, or at least the manufacturer and inspector should agree on these points, which is provided for in the specifications of the American Society for Testing Materials. Not infrequently inspectors demand bars to be attached at locations where it is impossible to secure a satisfactory bar either on account of the section of the metal, or the design of the casting or the location of the bar in the mold.

Records of Heats

The committee finds that most manufacturers of steel castings are put to a great deal of expense and delay on account of being obliged to stamp the heat number on each casting. When it is considered that very frequently castings weigh under one pound, it is realized how much work is involved. This requirement should be done away with. This is also true of the requirement in some of the specifications that a casting record be kept of all castings, even when they are less than 200 lb. in weight. The committee suggests that small castings be handled in lots and not individually as regards records of heat numbers and testing.

Welding Castings

It is well known that, in the manufacture of steel castings, from the nature of the material from which they are made and the special requirements of the manufacture of the molds, they are bound to contain more or less defects. The causes are sufficiently known to the manufacturers, who are constantly striving to overcome them. The inspector should have practical knowledge of the use of castings so that they can decide whether defects that are bound to occur are serious or not, and the use of welding should be permitted more than at the present time. A very timely article by Commander Jessop, United States Navy, appearing in the Jan. 3 issue of THE IRON AGE shows that welding can safely be resorted to and many castings used that otherwise would be condemned. Castings that are welded should be annealed to remove any strains that might be caused by welding.

Distorted Castings

There are many causes entering into the manufacture of steel castings which result in castings becoming distorted or warped. This is sometimes a question of design, and cannot be avoided. Distortion is also caused by lack of precaution on the part of the foundries, the presence or absence of fins, carelessness or errors in preparing the molds and many other causes, some of which can and some of which cannot be prevented. Information should be furnished the manufacturer before the castings are produced as to which are important dimensions so that every precaution can be taken to prevent undue distortion. A reasonable allowance should be made for variations that are bound to occur.

Castings acceptable in all other respects should be passed unless it is shown that they are distorted on account of carelessness in the foundry.

The manufacturer should not be held liable for any charges for straightening, welding, or otherwise making castings acceptable after they are received by the purchaser unless they have been notified in advance, and shall have given the purchaser authority for doing such work at the manufacturer's expense.

The foregoing is signed by L. E. Thomas, chairman, vice-president Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa., W. D. Sargent, president Bayonne Steel Casting Co., Bayonne, N. J., and H. E. Field, president Wheeling Mold & Foundry Co., Wheeling, W. Va., as the committee. The report has been sent to the various bureaus of the Government who are considering it.

Portable Bench Grinding Machine

The Temco Electric Motor Co., Leipsic, Ohio, is making a portable bench grinding outfit which takes, as indicated in the accompanying illustration, two emery wheels to be driven electrically by an ordinary extension lighting cord and attachment plug fitted into a nearby electric outlet. It takes 1/6 hp. and the wheels, which are 6 in. in diameter and ½ in. thick, are run at 3700 to 3800 r.p.m., depending upon whether the supply of current is alternating or direct. The machine may be furnished in a type suitable for attaching to an upright post or the side wall and may of course also be mounted on a pedestal. It is 8 x 12 in. in size of base and has a height with base of 9 in. and weighs 40 lb. complete with the base.

Temco Grinding Machine

The large manufacturing interests in what was once the Indiana gas belt, with Muncie as a central point, are alarmed by the petition of the railroads to have abolished the 10-cent differential coal rate established in order to retain these factories when natural gas became exhausted. The attitude of the railroads is that these manufacturers have passed the fuel crisis and should now be able to operate without special privileges. A hearing on the petition has been set by the Indiana Public Service Commission.

Profits Subordinate to War Necessities

Speakers at Annual Meeting of the Chamber of Commerce of the United States in Chicago Make Plea for Sacrifices—Shipbuilding Takes Pre-eminent Position

Government Organization in Relation to Business in War.

Finance.

Railroads and Highway Transportation.

Shipping.

These four topics, with their many ramifications, intermixed with patriotism at fever heat, formed the basis for the expression of innumerable opinions and views at the sixth annual meeting of the Chamber of Commerce of the United States, attended by over 3500 persons, in Chicago, April 9 to 12, inclusive. Importance was lent to the convention by the presence of men high in official life, including the Earl of Reading, British Ambassador Extraordinary and Minister Plenipotentiary; Secretary of the Navy Josephus Daniels, and Secretary of the Interior Franklin K. Lane, as well as by men of high rank in banking, shipbuilding, transportation and trade. The four main topics were considered simultaneously in as many meetings. The keynote sounded by President R. Goodwyn Rhett, Charleston, S. C., was:

"What is not for the good of all is not for the good of business."

Harry A. Wheeler, Chicago, who holds the post of Illinois Food Administrator, was elected president of the Chamber.

The resolutions adopted were voluminous, covering almost every phase of the present business situation. Regarding hostile acts and sabotage, it was resolved:

"We urge all branches of the United States Government, legislative, executive and judicial, by tireless vigilance, rigorous enforcement, relentless pursuit and prosecution, and severe penalties, to visit (to the full limit) stern and prompt punishment upon all persons found guilty of such acts, whether they be alien enemies abusing hospitality and presuming upon the national patience, or traitors dishonoring their citizenship."

Labor for Shipyards

The Chamber's stand indorsing universal military training was reaffirmed. On the question of labor for shipyards, this stand was taken:

"That the Chamber of Commerce of the United States, earnestly recommends to all business men and all business organizations, in communities where ships are being built or ship parts being produced, that the private interests of individual business men and the normal interests of business organizations be made secondary to the business of aiding ship production during these critical months.

"Resolved: That it be recommended to all local business organizations that they take such steps that the shipyards shall have first call upon the best labor and executive ability available in their respective communities, so that in this crisis it cannot be said that private business has better skilled labor or executives than shipyards.

Congress was urged to appropriate $50,000,000 for the construction of concrete ships. As business is conducted to-day frequently in violation of the Sherman and Clayton acts, the Board of Directors of the Chamber was requested to consider the appointment of a special committee to prepare a referendum on the question of requesting Congress to examine promptly the whole situation, including the Federal Trade Commission, and amend or replace existing laws with "clear, reasonable and adequate new legislation." On the subject of Government control it was voted that measures which have for their object the control of industries be subjected to close scrutiny and be adopted by Congress only when necessary to make the conduct of war more effective.

New construction work for non-essential industries or for municipalities, etc., was declared untimely and deserving of discouragement. The established method of regulating exports through licenses and permits was approved. It was voted that some authorized governmental body declare what industries are essential for the conduct of the war as rapidly as this may be warranted. The Chamber's approval of Government price-fixing was reaffirmed, and centralized war buying was endorsed.

To Prevent Delays

"Whereas, Specific cases have been called to the attention of the Chamber of Commerce of the United States with respect to delays and in some cases failure to secure supplies necessary to the Government's war activities, because production was suspended by the Government pending the result of experiments,

"Resolved, That the Chamber of Commerce of the United States earnestly recommends to the Government that until improvement in any article required by the Government for war purposes has been demonstrated, and adequate facilities provided for the production of such improved article on the needed scale, the Government should procure articles of tried and known value required for immediate use which can be supplied to it in the necessary quantities."

It also was voted that the directors of the Chamber should, at their discretion, call a conference representative of all interests concerned at which the "broad aspects of the transportation problem and the formulation of a basis for the control and operation of the transportation facilities of the United States after the conclusion of the present Government control" should be considered.

Fundamental Sacrifices

At the Wednesday afternoon session addresses were made on finance by Charles S. Hamlin of the Federal Reserve Board; on railroads by Harry A. Wheeler, chairman of the National Chamber's Committee on Railroads and the chamber's Activities in Relation to Government Organization, Shipping and Finance by Waddill Catchings, chairman of the Chamber's War Committee; Edward A. Filene, chairman of the War Shipping Committee, and Wallace D. Simmons, chairman of the Committee on Finance.

Mr. Filene, who is president of William Filene's Sons Co., Boston, speaking on shipping, said: "The need of ships can perhaps be visualized if we remember that all of the money which we are now so patriotically, so generously giving for Liberty bonds, cannot be effective until there are enough ships to carry across the ocean the supplies that money pays for. At present there are not enough ships, and before we get enough ships we business men, the community as a whole, and the ship workers, but we business men especially, shall have to make fundamental sacrifices. Giving never reaches the full duty of patriotism until it has mingled with it a large part of personal sacrifice. And business men will sacrifice, and will sacrifice to the limit, when they understand the situation. . . . I want the business men who live away from our seaports to bear in mind that the quickest coming of ships will not be from those yards where a ship is built as a whole, but from the yards where fabricated parts from everywhere are brought together and assembled."

Save and Serve

Mr. Hamlin said: "We hear people say: 'Business as usual.' We hear others say: 'Absolute destruction of non-essentials.' I hope that we can find a happy medium between the two. Non-essentials should be changed gradually to essentials. Labor should be gradually released and mobilized, and shifted from the non-essentials to the essentials. But when we talk of business as usual we might as well say, 'Let us eat, drink and be merry, for to-morrow we die.' Our motto should be, 'Let us save and serve, for to-morrow we crush the Hun.'

"I admit that some of us may have our profits re-

stricted for the time. That is our chance for sacrifice. Our brave boys on the other side are making sacrifices; they are freely pouring out their blood and offering their lives for their country; and some of us may have to offer up our profits. . . . We are going to have supreme confidence in ourselves, as we have in our boys on the other side, and if the watchman asks, 'What of the night?' we can say 'All is well in the United States.'"

Profit Interest in War Opposed

Thursday was the big day of the convention, each topic being considered separately in the four different sessions, both morning and afternoon. Mr. Catchings presided at the meeting which considered Government Organization in Relation to Business in War. In opening the session he said that business exists for profit, but that in these times of emergency business men are seeking to serve the Government and not themselves. He laid stress on the necessity of creating conditions under which business men will not be suspected of self-interest. He declared the Chamber is against a profit interest in war. To the extent that business men eliminate the profit interest in war will they be available in solving its problems. The solution might lie, he said, in an excess profit tax that would absorb profit, also that until business men solved the question of profit interest in war it was natural they should be discredited. In Washington it is known that there is a great desire on the part of business men to serve, but there also is a feeling that in some cases there is a desire for profits which should not be expected at this time. In the handling of these problems it was essential that business men act through their organizations as a unit and not as individuals.

Business Men Must Help Themselves

George N. Peek, industrial representative War Industries Board, Council of National Defense, spoke on "How to Keep Industry Going and Carry on the War." Through the medium of a chart Mr. Peek explained the newly created requirements division of the War Industries Board, and went into some details as to materials and supplies which are to have preferential treatment. He said, in part:

"Business men must not sit back and wait for Government officials to make constructive suggestions as to how their industry may be operated during the war. The initiative must be taken by them. It is folly for business men to make suggestions which are selfish or which are not based on the good of the country as a whole."

"It is physically impossible for us in Washington to treat with each individual manufacturer in each line of industry. Valuable information concerning the industry as a whole is seldom obtainable from the individual manufacturer.

Predicts Change in Industrial Relations

Prof. Leon C. Marshall, University of Chicago, until recently secretary of the advisory committee of Labor Administration, Department of Labor, said some good things about labor leaders he had met, also that with wage conditions such that labor "milled" around like cattle it was not surprising that the labor turnover was great. In detail he told how labor drifted from place to place, seeking higher wages, meantime finding bad living and housing conditions. He attributed all this to a lack of centralization of Government powers and bad teamwork on the part of employers. He declared that industry had not learned to treat labor as a factor in production as it had finance, materials, machinery, etc. The Government is now endeavoring to direct the proper administration of labor, and a national labor policy or plan will be evolved. The chief incentive of labor to-day, said Prof. Marshall, is wages, and everyone knows that money is not the best incentive in the world. He believed that greater dependence on the United States Employment Service will bring about a degree of labor rest, and he advised against the use of newspaper advertisements. Whether the industrial world likes it or not, there is going to be a change in the industrial relations of the future, he said.

William H. Van Dervoort, member of the official Conference Board of Employers and Employees, declared: "If there ever was a time when we ought to give constructive help and not destructive criticism, it is now."

Points Out Two National Mistakes

He said that he wanted to emphasize two points: The great national mistake made in not beginning war work earlier, and the great national mistake in placing cost-plus-profit contracts. He explained the work of the National Industrial Conference Board, and said the one great menace which remains to be cleared away is the labor controversy. That production has been retarded by 3500 strikes since the war began constituted a blot.

Mr. Van Dervoort made a plea that the citizens of the country forget that they were employers or employees, and said that class should be abandoned and citizenship take its place. He asked: If the business interests should defeat the Government aims what would the temporary gain amount to? The same situation is true with regard to labor. He made the point that the real employers of the country are the ultimate consumers, and that the great bulk of these are the workers for wages.

The Conference on Shipbuilding

The meeting at which shipping was considered was replete with addresses on all phases of that subject. Edward A. Filene presided

The Rev. Dr. Charles A. Eaton, head of the National Service Section of the Shipping Board and Emergency Fleet Corporation, paid a tribute to shipyard management, and said he appeared to ask a square deal from the American people for the men who are building the ships and managing the yards. He said: "Labor is a national asset and capital is a national asset. They are the two foundations of our civilization, and our civilization will not rest on any permanent foundation unless these two are united. I want to see a national policy adopted in this country. . . . There has been a money class and a laboring class, and I tell you in the name of history and in the name of God you cannot build a permanent civilization upon a class. It never has been done and it cannot be done here." At the close of a fervid peroration he declared: "Trust the men and they will trust you.'

Meyer Bloomfield, head of the Industrial Service Department of the Shipping Board, who recently returned from a tour of the shipyards of the Pacific coast, said that there they are building ships fast and well, and that the most inspiring fact he encountered was the spirit of labor on the coast. He found an efficiency that never before has been reached in the shipbuilding history of the world.

Crawford Vaughan, ex-Premier of South Australia, referred to ships as the "bridge to victory."

John A. Penton, Cleveland, gave an interesting résumé of shipbuilding on the Great Lakes. B. F. McLeod, Charleston, S. C., said a recent investigation made by him was convincing that the greatest problem of the shipyards is finding a sufficient number of skilled men.

Open and Closed Shops

George M. McClellan, of Honolulu, offered a resolution that excited no little discussion. It read:

"Resolved, That it is the sentiment of the Chamber of Commerce of the United States that the United States Shipping Board should grant contracts to any and all responsible shipbuilding companies which are able and ready to build ships, irrespective of whether such yards are run as open or closed shops."

Mr. McClellan read a telegram stating that a Pacific yard, in every way well equipped, had been unable to get a contract, the presumption being that it was because the yard was run as an open shop. The motion was seconded, but members questioned the wisdom of giving it endorsement in view of the fact that the National War Labor Board, to handle labor questions, had been appointed by President Wilson. The statement was made that a controversy which might become bitter should not be injected into the general issue which now confronts the nation.

Is There a Ship-Plate Shortage?

J. L. Replogle Affirms There Is—Sharp Passages Between Director of Steel Supply and Chairman Hurley—We Owe 700,000 Tons of Steel to France and England

WASHINGTON, April 16.—A notable contribution to the controversy as to whether a steel plate shortage now exists has been made by the Senate Committee on Commerce in removing the seal of secrecy from a statement made to the committee in executive session on April 5 by J. Leonard Replogle, director of steel purchases of the War Industries Board. While declaring that the demand for steel plates does not exceed the unobstructed capacity of the mills, Mr. Replogle asserted with emphasis that at the present time there is an acute shortage, and took issue with Judge Gary and Mr. Farrell of the Steel Corporation and Chairman Hurley of the Shipping Board for public statements made by them designed to create the impression that there is an ample supply of plates. While conceding that Judge Gary and Mr. Farrell are in an excellent position to know what the mills are producing, Mr. Replogle pointed out that they have no information concerning the commitments of the War Industries Board to the Allied Governments and in this connection he declared that the plate mills to-day have 2,374,711 tons on order, including 300,000 tons of plates which General Pershing has agreed to turn over immediately to the British Government in part payment for over 700,000 tons of steel material of various kinds supplied to the American forces abroad by the Governments of Great Britain and France.

Shipping Board Said, "Hands Off"

Mr. Replogle produced a distinct sensation when, replying to questions as to why the War Industries Board had failed to maintain a supply of plates for the shipyards, notably the fabricating steel plant at Hog Island, he declared that this would have been done, regardless of other engagements of the plate mills, but for the fact that officials of the Shipping Board had notified him in writing to "mind his own business," as experts of the board were pursuing their own follow-up system with respect to ship plates. At this juncture a dramatic touch was given the proceedings by the action of Chairman Fletcher in calling into the committee chamber Chairman Hurley, who chanced to be in an adjoining room, and inviting him to participate in Mr. Replogle's examination. Mr. Hurley was seated at the table opposite Mr. Replogle and the further proceedings of the committee consisted chiefly in a rapid crossfire between the witness and the chairman of the Shipping Board. Both men held themselves well in hand, displaying admirable self-control, but the air was heavily charged with electricity and some of the exchanges were decidedly pointed.

Mr. Replogle was able however, to substantiate his statements with incontestable documentary evidence and Mr. Hurley promised the committee that "before half past 4 this afternoon" he would turn over to the War Industries Board the task of following up plate orders to keep the big shipyards supplied. Mr. Replogle paid a high tribute to the leaders of the iron and steel industry and declared that the plate mills were giving an excellent account of themselves, but had been seriously handicapped by lack of fuel and transportation, factors in the problem over which they had absolutely no control and which the War Industries Board had been unable to resolve satisfactorily, notwithstanding repeated appeals to the Fuel Administration and the Director General of Railroads.

In view of the importance of the statements of Mr. Replogle certain members of the committee suggested that the public was entitled to receive them, but it was not until after very careful deliberation that the seal of secrecy was removed.

The Hog Island Delay

Mr. Replogle's examination began with a question by Chairman Fletcher as to whether he could supply the committee with any information bearing upon the statement made before the committee recently by Vice-president Baldwin of the American International Corporation, to the effect that the actual construction of ships at Hog Island has been delayed a fortnight or more owing to lack of steel plates, of which the yard was said to be short at least 50,000 tons.

"That condition," replied Mr. Replogle, "is due to a number of causes; and right here I want to correct the general impression that the steel mills have fallen down. They have responded wonderfully well to every request we have made to them; but their operations were restricted in January and February to an enormous extent owing to their utter inability to secure sufficient fuel. Some of the most important plants were operating at 40 to 50 per cent of capacity and several plants, notably the Worth Brothers plant at Coatesville, Pa., the plant of the Midvale Steel & Ordnance Co., one of the very largest plate producers in the United States, were unable to make a ton of steel from Jan. 17 to Feb. 20, over one month, on account of inability to secure coal despite every effort made by the War Industries Board with the Fuel Administration and railroad people to give them relief."

At the suggestion of Chairman Fletcher, Mr. Replogle enumerated the principal steel plate mills, stating that the Steel Corporation controlled the largest plants, having an aggregate capacity of 3,500,000 tons of plates as compared with the total output of about 6,000,000 tons. Answering a question by the chairman as to whether "the trouble in furnishing the necessary steel for the shipyards goes back to the producers of steel from the ore," Mr. Replogle said:

Western Fabricators Made Lower Prices

"The loss in total steel production does, but the trouble in the shipyards is due to several other causes. We believe that it was unfortunate that so much of the steel order was placed in the early stages with the Far Western concerns and we believe that transportation has been one of the biggest factors in the delay at Hog Island. Something like 62 per cent of the steel had left the mills on March 16 and only 3 or 4 per cent had been received at Hog Island. As to the claim the Hog Island people make that they got better prices from the Western fabricating shops than they could get from the Eastern concerns, I think that the United States Government has sufficient power in war time to compel the Eastern fabricators to come down to a fair and reasonable price and I think that could have been done.

"I wrote to Mr. Piez, general manager of the Emergency Fleet Corporation, yesterday showing him that in the first quarter of this year 618,177 tons of steel was shipped from the mills to the fabricators as compared with the corporation's estimated requirements of 590,428 tons, an excess of more than 27,000 tons. As regards Hog Island, I think that a big factor

in the situation has been the delay in getting plans to the fabricators. A number of the fabricators have reported that they had a very large tonnage of steel on hand and were unable to work it up on account of not having detailed drawings."

Steel Shipped West and Then Back

Taking up the matter of the distribution among the fabricators of plates intended for Hog Island and the other Government yards, Mr. Replogle told the committee that much time was lost and a great deal of railroad congestion produced by rolling plates in the East, shipping them to far Western points, including Minneapolis, Kansas City and Omaha, to be fabricated and then shipped back to the seaboard. This was done while many Eastern fabricating plants were running less than full time for lack of orders.

"I wrote Mr. Hurley in November," said Mr. Replogle, "calling his attention to the fact that the fabricating plants in the East near the Hog Island shipyard were operating at a very low rate of capacity."

"They explained that to the committee," said Chairman Fletcher, "by saying that the arrangement was more favorable to the Government both as to cost and as to time. What do you think about that?"

"I have been told that that was a fact," replied Mr. Replogle, "but I believe the Government in war times should not have permitted it to be done, for it was a loss of time and an enormous factor in the congestion of transportation."

No Preference to High-Priced Steel

"I wish," said Senator Harding, "that you would make a statement concerning the relative shipments on orders for steel for the Government and for private industries, for there is an impression that many of the steel mills have given preference to their private orders owing to the higher prices received under them."

"That impression," responded Mr. Replogle, "is absolutely incorrect, and as indicative of that I might say that the United States Steel Corporation has an order for 25,000 tons of plates for the Cunard Steamship Co. at a price of 8c. a pound, but the steamship company has been absolutely unable to get those plates from the corporation, which has been making plates at 3¼c. a pound, the price agreed upon by the War Industries Board and the steel manufacturers. In other words, they have executed the lower priced contracts and it is an absolute fact that price has had no consideration in the production of steel for the Government. That statement is quite as true applied to other steel producers as to the Steel Corporation.

How Fuel Order Cut Output

"I would like to make a statement to the committee concerning the general situation that has prevailed in the steel industry. At the time of the Garfield coal order, Jan. 17, 1918, the production of merchant bars dropped from 137,000 tons a week down to 55,000 tons. Plates for ship construction dropped from 90,000 tons to 45,000, or just 50 per cent. Projectile steel, which is a very important factor, dropped from 67,000 tons to 37,000 tons.

"After the mills began to get fuel the production steadily increased and the output of plates now, according to our telegraphic reports for last week, is 106,000 tons a week, or just 12,000 tons a week more than the country has ever produced in any week in its history. But this is the condition the steel manufacturer was up against earlier in the season: His mill was shut down either 100 per cent or restricted to an average of about 45 or 50 per cent. Even to-day at the blast furnaces pig iron is being produced at the rate of about 27,000,000 tons as compared to an annual capacity of about 45,000,000 tons; in other words, a little more than 60 per cent.

Pershing Owes Allies 750,000 Tons

"Now we are going to get into a very serious situation in regard to other things. The necessities of our Allies are very great. General Pershing has secured some 750,000 tons of steel from the French and the British Governments to meet his urgent necessities and has agreed to replace it with an equivalent tonnage of steel in this country in various forms of plates, projectile steel, etc.

"We are producing projectile steel largely in rail mills because before the war there was no capacity for that kind of steel and no necessity for it. We are rolling those projectile shapes in rail mills and now the necessities of the railroads are such that they will have to be given every consideration; otherwise our transportation system will break down. Yet we are overdue on the steel we have promised to replace with the Allies, for some of it was promised several months ago. We are giving them now a part of what is due, but at the same time we are seeking to meet first the necessities of the Emergency Fleet Corporation."

"What are the relative priorities of the Emergency Fleet Corporation?" asked Chairman Fletcher.

"They are practically all AA1, the highest order of priority. The Fleet Corporation's work comes ahead of some of the Navy work, not ahead of the torpedo boat destroyers or those submarine chasers, but 70 per cent of the Fleet Corporation's tonnage has the highest priority rating."

"Do you think," asked Senator Vardaman, "there is a probability of your being able to furnish the material necessary for the construction of these ships from now on as fast as needed?"

"Yes, sir. If we can secure from the Emergency Fleet Corporation the detailed requirements at each yard—not as a whole, but at each yard—we can and will meet them 100 per cent."

Responsibility on Fleet Corporation

"Will you now state," asked Senator Harding, "for the information of the committee and for the record, to what the shortage of steel in the shipyards is due as your board understands it; to a lack of detailed requisitions?"

"It is partly due to lack of detailed drawings," replied Mr. Replogle, "but it is largely due to lack of definite information from the Emergency Fleet Corporation to enable us to get at the particular order, the particular sections which they need now."

At this point it was announced that Chairman Hurley of the Shipping Board was in an adjoining room, whereupon Chairman Fletcher introduced him and invited him to hear Mr. Replogle's statement and to take part in the discussion. The hearing then continued as follows:

The Chairman. Let me see if I understand this correctly: It appears that somebody, in placing these orders, ordered the steel from the mills here in the East, and then made contracts for fabricating it in mills in the West; the steel has to be shipped out there, and then fabricated and shipped back to Hog Island. Now, who placed those orders? Who actually placed the orders as to each mill fabricating that steel?

Mr. Replogle. These particular orders were practically all placed, as far as I know, before Mr. Hurley went into the shipping board. And you will remember, Mr. Hurley, that I wrote to you, giving you the names of the fabricating plants in the East which were operating at a low rate of capacity.

Mr. Hurley. I remember that.

Mr. Replogle. And that is partly responsible for the delays. But there is a combination of reasons, including that, which is a big factor, and the delay of the American International Corporation in furnishing to the fabricating plants

details permitting them to fabricate the material which they now have in their yards.

War Industries Board Not Consulted

The Chairman. I understand; but what I am trying to get at is, did the Emergency Fleet Corporation, in its own office, place these orders? Did they not confer with the War Industries Board at that time?

Mr. Replogle. Not at that time, no, sir; that was not being done then.

Mr. Hurley. What was the date that we began to do that?

Mr. Replogle. You have been doing that for probably the last four or five months.

Mr. Hurley. As I understand it, our purchasing department places an order with the War Industries Board for 1000 tons of steel. The War Industries Board places that order with a mill; we have no voice as to the particular mill you place that order with. Is that correct?

Mr. Replogle. That is correct.

Mr. Hurley. After that order is placed with the mill, if that mill happens to be crowded with orders—

Mr. Replogle (interposing). As they all are.

Mr. Hurley (continuing). What efforts do you put forth to ascertain whether that order is going to be shipped to the fabricating plant that is producing fabricated material for the shipping board?

Mr. Replogle. Your people, Mr. Hurley, have objected to the War Industries Board taking any part in expediting the delivery of material until they have exhausted all efforts of their own. They have written to the shipyards to that effect.

Mr. Hurley. How long since?

Mr. Replogle. That was perhaps three or four months ago. As I have written the Emergency Fleet Corporation, we expect that if, by the ordinary methods, you can not get the steel when and as needed, and if you will give us the details of those cases, we will either reallocate them to another mill or we will insist on that mill producing it.

The Chairman. Why do you have to call on the Emergency Fleet Corporation for information as to when all of those orders are placed, when you place the orders and you ought to have them all in your office?

Mr. Replogle. Because those were their instructions, and they did not give us the information.

Chairman Fletcher examined Mr. Replogle at some length as to why the War Industries Board, which places orders with the plate mills, is not in position to know what the mills should supply without having to call on the Emergency Fleet Corporation. Mr. Replogle explained that the board had full information as to the commitments of each mill, but did not have the order in which the material was desired delivered by the yards, a condition that changed from day to day. This information, which was necessary to keep a steady flow of the right material to the yard, the Fleet Corporation refused to supply, "feeling that they could handle the situation themselves better at each individual yard." Mr. Replogle's examination then proceeded as follows:

The Right Steel for the Right Yard

Senator Vardaman. I asked a few moments ago, Mr. Replogle, about the cause of the delays, and you stated that it was the lack of detailed plans for these fabricated ships. Now that Mr. Hurley is present, I wish you would repeat what you said, so that we may bring out why these detailed plans have not been furnished.

Mr. Replogle. We have been told by fabricators—for instance, Carroll & Porter are one firm—and a number of steel men, such as Mr. Grace, report that there is a considerable tonnage at various shipyards on which the details of fabrication have not been given to the fabricating plant. I think you will find that the Submarine Boat Corporation is one of those yards. But the fact remains that we are shipping sufficient steel in volumes to build 550,000 tons of ships per month, and have been shipping at that rate for three months.

Mr. Hurley. Yes; but you are not shipping it to the right shipyard; and you are not shipping the right kind of steel; and if you place an order with a steel plate mill, and they have other orders and they do not ship the steel as per program, or if they ship the private steel first for commercial purposes, of course that interferes with the whole program. Your volume of steel may be in 10 yards and one yard may be short of steel.

Mr. Replogle. If that is true, that is due to our inability to get from the Emergency Fleet Corporation or the shipyards, the details which will permit us to correct that.

Mr. Hurley. What further details do you want, when you place this order with the steel company? What is your method of follow-up, so that you may know when deliveries should be made?

Mr. Replogle. All that we follow up is the requirements of the Emergency Fleet Corporation, the Navy, the Army, and the different departments as a whole, because your people have specifically stated that it is not our function to follow up those details.

Mr. Hurley. Well, I am simply trying to find out what the system is. You have not any follow-up system as to that?

Mr. Replogle. No.

Mr. Hurley. Suppose you place an order with a steel mill which can not possibly deliver it for three months. What is your method of trying to find out whether they can fill the order which they take within the time required?

Shortage Will Be Acute

Mr. Replogle. The reports which I have tell us the condition of the various mills and the relative importance of all the orders they have on hand; and in allocating that steel, it is given to the mills best adapted to produce it. It ought to be understood, to begin with, that, contrary to the general impression that has been created—and I am afraid, Mr. Hurley, that you have added to that—to the effect that there is a surplus of steel, there is a very acute shortage of steel, and particularly of plates, and it is going to become very much more critical. The Director General of Railways has plans for a large number of cars, and we have asked them to conserve the use of plates to the greatest possible extent.

Mr. Hurley. What is the capacity of plates in the rolling mills this year?

Mr. Replogle. The capacity is about 6,000,000 tons, or 6,250,000 tons.

Mr. Hurley. We can make three tons of shipping out of one ton of plates; and we will not need half of that.

Mr. Replogle. I assume that you can make almost four tons of shipping out of a ton of plates, or three tons out of a ton of all steel.

Mr. Hurley. Let me ask you this question: How much are the steel companies short in their tonnage?

Mr. Replogle. They have been running the plate mills on an average——

Mr. Hurley (interposing). I do not mean that. I mean on specific orders, in specific cases. Who are the chief violators in the non-delivery of plates?

Mr. Replogle. I do not know that there are any violators.

Mr. Hurley. Well, not necessarily violators; I mean, who is short in the delivery of orders?

Mr. Replogle. Practically every mill in the United States.

Mr. Hurley. Is the United States Steel Corporation short?

Mr. Replogle. Yes, sir.

Mr. Hurley. Our records do not show that.

Mr. Replogle. They are not particularly short as to your material, but there are a lot of other requirements——

Mr. Hurley (interposing). Well, we are talking about ships now. I am not interested in other material now. We want ships first. This material that you will put into ordnance, and all the other material, will stay in this country, and not go abroad unless the ships can be furnished.

Mr. Replogle. I am not speaking of ordnance, but there are requirements of plates in many other lines; for instance, for locomotive construction. They claim that they can not build the ships unless you have the locomotives to handle the material that goes into them.

Mr. Hurley. I deny that.

Mr. Replogle. That condition is improving each week; and we are shipping now at the rate of 12,000 tons a week more than has ever been produced before.

Mill Shortages on Plates

Mr. Hurley. How many mills now are short of steel plates, that can not perform their work. Do you know that?

Mr. Replogle. No; I do not know that.

Mr. Hurley. Then, if you do not know that, Mr. Replogle, how can you materially help in the present situation?

Mr. Replogle. Because that is your job. We had a perfectly definite understanding that the Emergency Fleet Corporation would anticipate their needs and advise us of the needs of each yard, and then we would take care of them.

Mr. Hurley. Do you mean each yard or each mill?

Mr. Replogle. Each yard. We have information as to the situation in each mill.

Mr. Hurley. How many notices have you received from the Fleet Corporation complaining about the non-deliveries?

Mr. Replogle. We received practically no notice until the last 10 days.

Mr. Hurley. I am simply trying to get at the facts. Have you received ten complaints, or twenty complaints, or one complaint?

Mr. Replogle. We have received one complaint.

Mr. Hurley. Then, do you mean to tell me that the Fleet Corporation has forwarded only one complaint, and that you knew nothing about this general shortage of material except through the Fleet Corporation?

Mr. Replogle. There may be a good deal of shortage at various yards, but we have instructions from the Fleet Corporation to keep our hands off until they ask us to do something about it. They said, "When we want your help and your advice, we will ask for it," and that is what we are waiting for now.

Steel Men Differ on Shortage

Mr. Hurley. What has Mr. Farrell done that you take exception to?

Mr. Replogle. The only exception that I took to Mr. Farrell—and I took that to Judge Gary and all the members of that committee—was that I told them they were creating an entirely wrong impression as to the plate situation in this country; that, contrary to the opinion that was being expressed to the effect that there was a surplus, there was a decided and very acute shortage.

Mr. Hurley. Do your figures show that?

Mr. Replogle. Absolutely.

Mr. Hurley. Do they show the capacity of the different mills?

Mr. Replogle. Yes.

Mr. Hurley. Did you see that telegram that Judge Gary sent abroad?

Mr. Replogle. Yes.

Mr. Hurley. He said there was plenty of steel, did he not?

Mr. Replogle. No.

Mr. Hurley. He said they could produce 5,000,000 tons or more of steel and could increase the capacity if necessary.

Mr. Replogle. Even 5,000,000 tons would not be sufficient.

Mr. Hurley. Have you a statement of the requirements, then, to offset Judge Gary's statement? Have you got the figures regarding the situation there?

Mr. Replogle. I do not have them. But the program by the Director General of Railways will require 575,000 tons of plates. We have 300,000 tons for England——

Mr. Hurley (interposing). I am not talking about that. Judge Gary and Mr. Farrell and the other steel men in the American Iron and Steel Institute say that there is plenty of steel. Now, you make the statement that we are going to be short of plates. In order to back up your statement, you ought to be able to give your reasons for saying that. There is a discrepancy between your statement and Judge Gary's telegram to Mr. Baruch on the subject; and I think we ought to get the facts.

Mr. Replogle. The trouble is, you take the opinion of every one about the steel requirements of the Government——

Mr. Hurley (interposing). I am not taking it; I am asking you about the telegram that Judge Gary sent out.

Mr. Replogle. If that is true, why do they not get the plates? We are short of plates.

Judge Gary's Optimistic Telegram

Mr. Hurley. I am only trying to bring out the facts; we are trying to do the same thing; but you make one statement and Judge Gary makes another; I do not know which is correct. I believe both of you are trying to give the facts; we are entitled to know the facts. Now, you take Judge Gary's statement and his telegram to Mr. Baruch. What have you to say to that?

Mr. Replogle. Mr. Hurley, I do not mean to dispute Judge Gary's knowledge of the situation; but he is not in a position to know the requirements of the united Governments. There is only one place that that information can be obtained, and that is down in our office.

Mr. Hurley. What are the requirements of the Allied Governments? I know something about that.

Mr. Replogle. England right now wants 300,000 tons of plates, and our Army people have agreed to furnish them an enormous tonnage of plates. The details of that are now on the ocean coming over here, from General Pershing. He has taken 700,000 tons from them, and 300,000 of what is to be returned will have to be in plates.

Mr. Hurley. What will the plates be used for?

Mr. Replogle. The plates will be used for ship construction.

Mr. Hurley. Well, of course, you will not furnish those until you take the matter up with us, and the entire problem is settled?

The Chairman. What is the supply now?

Mr. Replogle. It has been down as low as 45,000 tons a week; and it is now up to 105,000 tons of steel.

Plate Orders 2,374,000 Tons

The Chairman. How much of plates have the mills on hand?

Mr. Replogle. It is shipped as made. There are 2,374,711 tons on order. Sixty-two thousand tons of that is for the Army; 182,000 tons of it is for the Navy; 831,018 tons is for the Emergency Fleet Corporation. The total Government orders for plates for the United States Government are 1,203,000 tons. Canada has 700,000 tons; England, 53,000; France 39,800 tons; Italy, 43,000 tons, and the balance is domestic, non-Government commerce, for the locomotive builders, the car builders, the builders of tanks for oil refineries, and work of that character. The reports that I have show each week where they are shipping the material; and they are not shipping very much non-Government material, except some on which there is a high priority rating, which, after consideration by the Priorities Board, was deemed of sufficient importance to give them a very high rating.

Mr. Hurley. Will you not specify just one or two of the high priority ratings that are ahead of us?

Mr. Replogle. Well, there is some for instance on the boilers.

Mr. Hurley. Boiler plate; all right.

Mr. Replogle. And there is some on the fireboxes and stuff of that kind.

Mr. Hurley. That is for locomotives.

Mr. Replogle. I was instructed to give England 5,000 tons a week of ship plates.

Mr. Hurley. Are you doing that?

Mr. Replogle. We have been doing that in the last few weeks.

Mr. Hurley. Do you not think our shipyards ought to get that first?

Mr. Replogle. Yes.

Mr. Hurley. Did you get permission from the Shipping Board?

Mr. Replogle. Yes.

Mr. Hurley. They released it, did they?

Mr. Replogle. Yes; 10,000 tons. But it comes right back to this: There is no use of our shipping to the Emregency Fleet Corporation plants which do not need steel—and we are doing that, because you do not tell us when they do need it.

Mr. Hurley. How long have you known that?

Mr. Replogle. For several weeks. They are still clamoring for plates.

Mr. Hurley. It all goes back to this: That you place the orders, and that you placed them with some steel companies that could not deliver it, for one cause or another; you are not necessarily to blame for that. It may be that if you did place the order with a concern that could not deliver it in six months, and you wanted it in two months, that would be a mistake. Are you familiar with the priorities placed with those concerns before you placed those orders?

Mr. Replogle. I have that information before me, the priorities as to each individual plant.

Mr. Hurley. Well, with all that, if they do not ship the plates after the order is placed, there is where the trouble is. The fact is, that these orders are placed in thousands of tons, and nobody follows them up. Of course, with all this criticism it must be said that this is a big job. But everybody figures that as soon as his order is filed the war is won; you do not follow it up.

All Orders Followed Up But Those of Emergency Fleet Corporation

Mr. Replogle. We do follow it. We follow up all but the Emergency Fleet Corporation orders, and we have been instructed not to follow those up, by your people.

Mr. Hurley. I remember about that.

Mr. Replogle. Admiral Bowles told me frankly that it was none of my business, practically.

Mr. Hurley. That is an individual case.

Mr. Replogle. It is the individual case that counts.

Mr. Hurley. Will you answer this question: In what way did Mr. Farrell interfere with your work? He volunteered to see that these plates were delivered to the different shipyards. Your people did not want him to do that. You took exception to that.

Mr. Replogle. No; I did not. On the contrary, I asked them to do that; it was at my request that they did that.

Mr. Hurley. Are they doing it now?

Mr. Replogle. They are doing it now.

Mr. Hurley. Are they responsible for this failure to deliver?

Mr. Replogle. I do not think any steel man is responsible

(*Continued on page* 1041)

ESTABLISHED 1855

THE IRON AGE

EDITORS:

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Published Every Thursday by the IRON AGE PUBLISHING CO., 239 West 39th Street, New York

W. H. Taylor, *Pres. and Treas.* Charles G. Phillips, *Vice-Pres.* Fritz J. Frank, *Secretary* M. C. Robbins, *Gen. Mgr.*

Owned by the United Publishers Corporation, 243 West 39th Street, New York. H. M. Swetland, *Pres.* Chas. G. Phillips, *Vice-Pres.* W. H. Taylor, *Treas.* A. C. Pearson, *Secy.*

BRANCH OFFICES—Chicago: Otis Bldg. Pittsburgh: Park Bldg. Boston: Equitable Bldg. Philadelphia: Real Estate Trust Bldg. Cleveland: Guardian Bldg. Cincinnati: Mercantile Library Bldg. San Francisco: 320 Market Street.

Subscription Price: United States and Mexico, $5.00 per year; single copy, 20 cents; to Canada, $7.50 per year; to other foreign countries, $10.00 per year.

Entered as second class matter, June 18, 1879, at the Post Office at New York, New York, under the Act of March 3, 1879.

A Maximum of War Effort

A sensible suggestion emanated from the Washington authorities recently, that business correspondence be infused with the war spirit. It is not sufficient for a maximum of war effort that we assume, from theoretical considerations, that all are filled with the war spirit and the spirit of cooperation. It helps greatly to see and hear the evidence that all are imbued with the same feeling.

A nation in such a war as this goes through a certain series of psychological reactions. Eventually a stage is reached when there is steady plodding, a serious grind, but that is after years. The nation is then as fully permeated with the spirit of war service as it can be. The adopted attitude is so complete, and the public regulations are so well formulated and far-reaching, that there is practically no occasion left for individual initiative. In both Germany and Britain, for example, there is a tremendous amount of talk about food, certainly impractical and according to all experience not calculated to assuage hunger. The case of Germany, where everything must be done by rule at all times, may perhaps be understood, but the British case is not so readily apprehended. It is such, however, that G. K. Chesterton recently contributed an article, half humorous, yet really wholly serious, suggesting that there should be rationing of talk about food.

The United States is far from having reached the stage of being as full of war feeling as possible. Much still rests upon individual initiative, upon the acquisition by the individual of additional enthusiasm to do the utmost.

If the war should be lost or if an indecisive peace had to be accepted there would be unmeasured and lasting regret. Assuming a complete victory eventually, it is of vital importance both to the nation and to the individual to keep in mind that little glory will attach to achievements of nations, of armies or of individuals for what they did not do to help win the war. All are expected to do their utmost, and no particular credit will attach to the accomplishments that analysis may prove to have been most helpful to the success. If military judgment is that it was an army of France, or of Britain or of the United States that struck the really decisive blow, the laurels will be empty when the whole cause has been such a great one.

The real measure, when all is over, will not be what the nation, the army, the class of people, or the individual accomplished, but what could have been done but was not done. If the people of France have given their last ounce of effort and the people of the United States have held back only their last pound, it will not matter that the sum total of effort on the part of the United States was greater than that of France. Judgment will be based upon what was withheld, not what was given. The part one plays, measured by the parts others play, will be of little consequence. It is the part one has played, measured by the part that could have been played, that will make that judgment in future when all is over and the score is reckoned.

It is no case of the individual or the nation doing a bit, but a case of doing the best, of omitting nothing that can be done. The United States entered this war with no pledge of a portion of national or individual effort, but with a pledge of everything. It is a war in which every country engaged should be striving to do its very best. There is no outside standard. The standard to be attained is the utmost that it is possible to attain.

Strikes in War Time

Samuel Gompers, president of the American Federation of Labor, seems to have trouble in keeping company with his better self for any considerable time. After reading some of Mr. Gompers's patriotic speeches and being informed in regard to various commendable acts on his part during the past few months in influencing industrial workers to help win the war, it is disappointing to find him taking the position he assumed last week in regard to the so-called sabotage bill. A conference report on this bill, which provides severe penalties for destruction of or interference with production of essential industries, contained a clause giving workmen the right to strike for better wages or working conditions and was rejected by the Senate solely on account of this clause. About the time the Senate was voting on this provision, Mr. Gompers was speaking at a meeting in Washington and predicting that the bill, if amended as proposed by Mr. Cannon, to make it unlawful to strike, would make strikers become law breakers. This recalls

the Gompers who defended the dynamiters a few years ago and only about a year ago threatened to violate a mandate of the Supreme Court of the United States.

Mr. Gompers does not yet seem to realize that when railroads, industrial plants and other properties are being commandeered by the Government and men are offering their lives for their country, workingmen must also sacrifice something and be willing to give up what in ordinary times are conceded to be their rights.

Owing, doubtless, to the attitude of such men as Mr. Gompers, the Senate proceeded to compromise, and after eliminating the section which would have given labor the privilege to stop work for higher wages or other objects, the Cannon amendment, making it unlawful for laboring men engaged in war work to go on strike, was eliminated. The final result is not clear, but apparently industrial workers, like other folks, are amenable to the broad restrictions of the measure and it may be possible to prosecute strikers for interfering with war work.

While it is unfortunate that Congress has not made a positive declaration on the subject of strikes in munition plants, the labor situation is improving and there is no reason for abandoning the hope that industrial peace will be assured through the operation of the new National War Labor Board, whose duties were definitely defined by the proclamation of the President last week. The action of the Chamber of Commerce of the United States at Chicago last week, in declining to take any action which might arouse class animosity at the present time, is worthy of commendation.

Information and Misinformation

A clear distinction should be made between the Washington dispatches that are printed throughout the country regarding the situation as to steel supply for war purposes and the information that is in the possession of those in Washington who are really carrying on the war work. In these busy times the reader of the daily newspaper is unlikely to pause and apply the higher criticism to what he reads. He is insensibly led to an erroneous viewpoint. Among other things, the Washington dispatches treat of industrial matters and diplomatic matters. News of diplomatic matters is carefully handed out. What it is desired the public should know is given and the correspondents are impressed with the necessity of publishing nothing else. The State Department, for instance, is acting as press agent for itself and strives to have it that nothing is published with which events later may not harmonize.

It is not so with industrial information. Those who give out industrial information, or leave the correspondents to rely upon their imagination, are not part of the industries whose affairs the Washington daily newspaper correspondents attempt to discuss. If the industry is misrepresented it suffers.

In the case of steel there is in some respects a real hardship from some of the misinformation that has been published so widely, suggesting to the casual reader that the supply of steel for war purposes is proving short in this or that respect. The steel industry does not complain. It is busy with many things and is simply trying to do its best; yet it really has ground for some complaint, and would have good reason to welcome some means whereby the facts could be more accurately placed before the public, and particularly that portion of the public that has steel requirements for future months that it would like to satisfy.

The divergence that exists between the supplies of steel at certain consuming points and the tonnages of steel that have left the mills is carefully pointed out by the Washington correspondent of THE IRON AGE, who also observes that the authorities in charge of the allotment of steel orders and the distribution of the steel orders have no serious illusions on the subject. The daily newspaper correspondent learns that steel is scarce in one form or another at this point or that, and having previously acquired the information that steel is made in a steel mill he reaches the elementary and to him satisfactory conclusion that the tonnage of steel that is leaving the steel mills is an inadequate tonnage. The total number of tons is insufficient.

Shipbuilders who are building ships at a satisfactory rate stay at home and continue applying their efforts in their offices and shipyards. Those who find conditions unsatisfactory go to Washington. The people look to Washington for their news and the color of that news is in keeping with the circumstances.

The steel-making industry well knows, but all consumers of steel do not know, that a very much larger tonnage of ship plates can be produced than can possibly be consumed in shipbuilding. The output of sheared plates, ¼-in. and heavier, in 1916 was at the rate of somewhat more than 150,000 gross tons a month, with capacity not fully employed in such manner as to produce maximum tonnage. With additions to capacity since completed, or nearing completion, the capacity is considerably more than double the output attained in 1916. Entirely excluded from these totals is the tonnage of light-sheared plates and of universal mill plates, which do not count to any extent in shipbuilding. Roughly speaking, about one gross ton of ship plates is required for three tons of deadweight vessel capacity, so that the total plate-rolling capacity, directed exclusively to steel shipbuilding, not counting wood and composite vessels, would cover something like a million tons dead weight of vessels per month, quite beyond the wildest dream for this year or any time in the discernible future.

Several things have occurred, the effects of which are now being felt. There was a serious curtailment of output of plates through weather and traffic conditions. There was a distribution of orders and specifications among mills that was not in all cases such as would dovetail precisely with operations at shipyards. There were serious delays in transit in the case of many shipments of plates. There were needless delays, due to sending Eastern steel to Western shops for fabrications. There were misunderstandings as to the quantities of plates that would be consumed at individual shipyards. Those in charge of steel

distribution were left without information as to the progress of shipyard work. There is reason to believe, also, that some plate mills adopted the view that practices common in the distribution of plates to car shops should apply to the distribution of plates to shipyards. In the one case there is an even flow of material, with collaboration between producer and consumer, who for years have been well acquainted. The shipyards are new and it is found their principles are different. It is a condition and not a theory. The steel mills have now adopted a new viewpoint. If the shipyards desire a stock of each individual size of plates that will last 30 or 60 days, they are to be given those stocks and then it will be their affair.

While this stocking-up process is carried out there is considerable burden upon the plate mills. Afterwards there will be a larger supply of plates to flow into other channels. In some quarters the impression is given by Washington dispatches that the flow of plates to shipyards must be increased and that as time passes the shipments must be increased further. From the fact that few ships have been built and yet plates are scarce, it is inferred that when more ships are built plates will be still scarcer. The impression conveyed is erroneous. Meanwhile many who have occasion to consume plates are discouraged from formulating plans and such a condition is distinctly disadvantageous to the plate market. It will be well to suspend judgment as to the supply of plates available in future months until a few weeks have elapsed and the program of stocking up the shipyards has been given an opportunity to work out.

The Viewpoint of the Trenches

From the Western battlefront of Europe, where he spent eleven weeks among the soldiers investigating conditions, E. H. Sothern brings a message to America which, if it could be read in every industrial plant of the country, would help tremendously in increasing subscriptions for the third Liberty loan, because it shows how directly the success of the loan is connected with encouragement of the thousands of Americans who are now in the armies in France.

"Every Y. M. C. A. hut at the front," says Mr. Sothern, "publishes bulletins of war conditions in America. The boys are kept supplied with information. They know now that the third Liberty campaign is on. They are watching to see what the people at home are doing about it * * * The pity is that it is not for us all to know and realize the power and wonder of this backing-up force to our armies abroad, and that we cannot get the viewpoint of the men in the trenches. Our support strengthens their morale and makes their resistance firm. If the third Liberty loan is subscribed, not once but twice over, the spirit of our men at the front will be doubled. They will fight with greater confidence and courage, if that is possible, for their fight will be more worth while to them. They will be striving to save a greater nation."

It now seems to be assured that the third Liberty loan will be over-subscribed, but the importance not only of selling bonds, but of getting a very large increase in the number of subscribers as compared with preceding loans cannot be over emphasized. It is particularly gratifying to note, as reported in our Pittsburgh correspondence elsewhere in this issue, that already a number of industrial companies have been awarded the honor flag which is given to any company having 100 or more employees, every one of whom becomes a subscriber to the third Liberty loan. May the list of these companies be a very long one!

Standards for Steel Castings

Standard general specifications for steel castings for Government purposes are a war necessity. They are also demanded as a matter of common sense. For years prior to the war it was often the case that a large steel foundry, doing a wide variety of Navy and Army work, would have at one time two or three or more inspectors from as many Government bureaus passing on castings, often made in the same heat of steel. Now, with a stupendous war demand for such castings the problem for the Government and the foundryman is many times complicated. The recommendations of the Steel Founders' Society of America, which appear in another part of this issue, merit careful study by the various Government bureaus and the final adoption of almost every suggestion. Some of the things brought out have long been seen to be necessary, and it is hoped that war conditions will bring about a reform that has been recognized in the trade as highly desirable for many years. One important result will be an economy in man power as well as Government efficiency. Why should two or three men do what one man can do as well?

There is no reason why a general specification cannot be adopted meeting the ideas of all three Government bureaus now concerned, especially since each specification is distinguished by only slight differences from the others and since in most cases castings for each bureau are made in the same heat or grade of steel. There is merit in the society's suggestion that the specifications of the American Society for Testing Materials, with slight changes, be adopted as standard. They have the advantage of being the product of years of experience of skilled men, impartial in their judgment of essentials.

Not only are the recommendations as to higher sulphur limits interesting, but the suggestion that the phosphorus maximum be 0.06 per cent to 0.07 per cent is noteworthy. Such a standard might help in the solution of the low-phosphorus pig iron problem by permitting the use of some irons not now meeting the standard of 0.035 per cent as maximum for phosphorus. If sulphur up to 0.07 to 0.08 per cent is not harmful, certainly a maximum of 0.06 per cent phosphorus in open-hearth castings is not dangerous. It is worth trying.

The recommendation of small annealing test lugs by which the proper heat treatment of the casting may be finally judged is not valuable. So small a broken section of metal is no criterion of the proper annealing of a large section of the casting, nor are the physical tests a much better indi-

cation. Some of the finest static results are often obtained from under-annealed metal. This was demonstrated in an article in THE IRON AGE, June 1, 1916, on "Steel Castings and Physical Properties." The only safe guides are the temperature and time of annealing, as well as the location in the annealer. An experienced judge can tell whether a casting has been properly annealed by its appearance, in conjunction with the data just mentioned.

A central inspection bureau is a necessary corollary of standard general specifications. Its adoption needs no urgent appeal. To-day the Ordnance Department of the Army is scouring the country for men for inspection work of all kinds, supplementing the large inspection bureaus of the two departments of the Navy. It is a question if the inspection of steel castings is not now carried to an extreme. The report referred to contains some valuable suggestions in that connection. It is also well to point out that one of the largest and most efficient railroads of the country has cut its inspection of steel castings to a minimum after years of more detailed inspection. The reasons for such a step by so large a purchaser of important castings could well be studied and its policy adopted in whole or in part in this emergency.

C. M. SCHWAB APPOINTED

Director General of the Emergency Fleet Corporation—Office Created for Him

Charles M. Schwab, chairman of the board of the Bethlehem Steel Corporation, was duly tendered and promptly accepted the position of director general of the Emergency Fleet Corporation, an office specially created for him. The position of general manager, heretofore held by Charles Piez in conjunction with the vice-presidency of the corporation, has been abolished at Mr. Piez's suggestion, thus leaving the new director general in supreme control. Mr. Schwab will enter upon his duties at once and has already made an appointment for an all-day session with Mr. Piez on Thursday of this week, when he will begin to familiarize himself with the details of his new task.

The official announcement of Mr. Schwab's appointment as given out at the office of the Shipping Board late in the afternoon of April 16 was as follows: "Edward N. Hurley, Charles M. Schwab, Bainbridge Colby and Charles Piez were received by the President at the White House to-day. It was stated that the subject discussed was the progress and condition of the National shipbuilding program. The carrying forward of the construction work in the 130 shipyards now in operation is so vast that it requires a reinforcement of the shipbuilding organization throughout the country.

"Later in the day, Chairman Hurley of the Shipping Board announced that a new office, with wide powers, had been created by the trustees of the Emergency Fleet Corporation. The new position is that of director general, and Mr. Schwab has been asked and has agreed to accept this position in answer to the call of the nation.

"Charles Piez, vice-president of the Emergency Fleet Corporation, recommended that the post of general manager of the corporation be at once abolished, so that Mr. Schwab as director general should be wholly unhampered in carrying out the large task entrusted to him. Mr. Piez since the retirement of Admiral Harris has been filling both the position of vice-president and that of general manager.

"Mr. Schwab will have complete supervision and direction of the work of shipbuilding. He agreed to take up the work at the sacrifice of his personal wishes in the matter. His services were virtually commandeered. His great experience as a steel maker and builder of ships has been drafted for the nation."

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Will Buy Large Tonnage of Bessemer Rails

Open-Hearth Steel Will Not Meet Requirements of Railroads—Production of Plates Not Expected to Be Large Enough for Ships and Cars

WASHINGTON, April 16.—Because of the heavy demand for open-hearth steel for the manufacture of shells, shrapnel and other war material the railroads of the country will be obliged to purchase, during the coming year, a large quantity of Bessemer rails, and may be called upon to use a considerable tonnage of lighter sections than have heretofore been purchased. This change in policy is expected to result from exchanges now taking place between the War Industries Board and the Railroad Administration throughout which the board has vigorously urged upon the Director General of Railroads the importance of curtailing as much as possible the railroad consumption of open-hearth steel in order that there may be an ample supply for war purposes.

Responses to Inquiry

The War Industries Board has been moved to take this matter up with the Railroad Administration as the result of the submission by Director General McAdoo to the board of a summary of the reports received from the railroads of the country of their requirements for the current year forwarded in response to a circular issued to the carriers on Feb. 27. The total of these requirements is so large that the War Industries Board has not hesitated to declare that it cannot possibly be provided regardless of the kind of steel employed in rail-making and the Railroad Administration has been warned that even to approximate the schedule submitted the carriers will be obliged to substitute a very large amount of Bessemer for open-hearth rails. The Director General is understood to have given assurances to the War Industries Board that the Railroad Administration will co-operate heartily in the effort to conserve the output of open-hearth steel, and it is expected that a supplemental questionnaire will be sent out to all the leading carriers to determine the extent to which the Bessemer rails can be utilized and the practicability of other suggestions made by the board with respect to the use of lighter rails.

Large Tonnages Required

The rail estimates of the roads for 1918 have surprised the Railroad Administration as well as the War Industries Board. The road managers appear to have reached the conclusion that in view of Government control, guaranteed income and the abnormally heavy traffic demands which must be met during the coming year or two, the present is a good time to rehabilitate rights of way. This policy would seem to be in line with that of the Government in deciding to purchase for the roads large quantities of rolling stock of the heavier types and in this respect the carriers appear to be following the example set by the Railroad Administration. As is well known, the railroads during the past two years have not felt that their net revenues justified them in purchasing any more rails, rolling stock or other equipment than has been actually necessary to handle their business and in many instances the carriers have failed to meet even the absolute necessities of the situation. Although the production in normal times of steel rails, both open-hearth and Bessemer, is figured roughly at 3,000,000 net tons, in 1916 the orders placed amounted to only 2,340,488 gross tons out of a production of 2,854,518 gross tons. In 1917 the roads were still in straightened circumstances and in keeping their rail orders down to a minimum of their requirements the road managers took some credit to themselves for relieving the pressure on the steel mills for war material.

Surprising Estimates

Director General McAdoo's questionnaire of Feb. 27 called for the number of gross tons put in track during the calendar year, 1917, the estimated tonnage required for 1918 both for maintenance and for new construction, the minimum quantity of rails "absolutely required to maintain track in safe condition" during 1918, and the number of gross tons contracted for delivery during 1918, including amounts due on previous contracts or carried over from contracts of previous years. The replies of the carriers under all these headings, except as to the tonnage put in track during 1917, have shown surprisingly large amounts. The most significant figures, however, have been the estimated tonnage for actual maintenance during 1918 and the quantity of rails absolutely required to maintain track in safe condition. While new construction is susceptible of being somewhat reduced, necessary maintenance requirements can hardly be curtailed with safety or with due regard to the efficiency of the carriers from a war standpoint.

Not Enough Open-Hearth Steel

The Railroad Administration is not yet prepared to make public the actual requirements of the roads as indicated in the summary transmitted to the War Industries Board, but the board has not hesitated to advise the Director General that it will be impossible for the steel industry to supply open-hearth rails to meet the schedule with due consideration for the demands of the mills now producing open-hearth rounds for munition purposes. A steady stream of this material must be kept flowing to the shell makers and the ordnance shops and notwithstanding the vital importance of maintaining the railroads of the country at a high state of efficiency, the Director General is warned that war material must come first and that the carriers must resort to every possible device to reduce their requisitions for open-hearth steel. Officials of the War Industries Board are disposed to take the view that some of the railroad managers have taken advantage of what they regard as a golden opportunity to put their properties in first-class shape and have asked for a much heavier tonnage of rails than is absolutely necessary. It is also surmised that in preparing their replies to the Director General's questionnaire they have used figures which they expected would be subjected to more or less pruning. However this may be, the board takes the firm stand that the roads cannot have what they ask in view of the war requirements for open-hearth steel.

Light Section Rails

The probability that the roads will be obliged to take a comparatively large tonnage of Bessemer steel during 1918 and that considerable quantities of light section rails will be utilized raises an interesting question concerning distribution. While, generally speaking, Bessemer rails are regarded as inferior to open-hearth, nevertheless several leading railroad systems, notably the Southern, used Bessemer rails until recently and with fairly satisfactory results. Railroad experts here

concede that many of the smaller roads can use Bessemer rails throughout and that even the larger systems can employ them for all purposes except main tracks called upon to carry the heaviest traffic. The suggestion that there will be available during this year a considerable tonnage of light section rails, a part of which has already been rolled, will be carefully considered by the Railroad Administration and road managers will be asked to utilize these rails for sidings and for small branch lines where the traffic is not too heavy.

It is the best opinion here that when the rail program has been finally pruned it will not exceed that of 1917 and will embrace a very considerable percentage of Bessemer rails. There is no purpose to reduce the efficiency of the railroads, for it is recognized that the carriers must be able during the next two years to handle unprecedented quantities of the heaviest commodities, including coal, ore, iron and steel in all forms, and that it would be very unscientific economy to cripple the roads in order to produce war material that could not be transported to the seaboard. In working out the problem, therefore, the needs of the roads will be carefully provided for, but special efforts will be made to utilize material not available for war purposes, especially as there is little reason to believe that it is practicable to increase the capacity of the steel industry during the coming year beyond the actual requirements of the war material program.

Shortage of Plates

A new factor has been injected during the past week into the situation with respect to railroad material as the result of an appeal from representatives of the Shipping Board to Director General McAdoo to reduce very substantially the tonnage of steel plates that will be required for the construction of the 100,000 freight cars which the Railroad Administration is now planning to order. These cars, as originally designed, call for approximately 575,000 tons of plates and will be built on eight different sets of plans. The Shipping Board officials declare that the shipbuilding program will be seriously interfered with if the Government goes into the market for any such tonnage of plates, especially if, as is expected, it invokes priority orders. It is reported that the Railroad Administration has been asked to cut its steel plate requirements in half by the double expedient of reducing substantially the number of all steel cars and redesigning the composite cars so as to substitute wood for a very large tonnage of plates. Experts of the Railroad Administration are looking over the Shipping Board's figures very carefully and a decision, both with respect to the board's request and as to the placing of orders for the railroad car program will probably be reached during the present week.

W. L. C.

Steel Corporation Orders Decrease

Unfilled orders on the books of the United States Steel Corporation on March 31 were 9,056,404 tons, a decrease of 232,049 tons from those reported for Feb. 28. The decrease in February was 189,400 tons, while the January and December reports registered increases. In March, 1917, the unfilled tonnage was 11,711,644 tons. The following table gives the unfilled tonnage at the close of each month since January, 1915:

	1918	1917	1916	1915
January	9,477,853	11,474,054	7,922,767	4,248,571
February	9,288,453	11,576,697	8,568,966	4,345,371
March	9,056,404	11,711,644	9,331,001	4,255,749
April	.....	12,183,083	9,829,551	4,162,244
May	.....	11,886,591	9,937,798	4,264,598
June	.....	11,383,287	9,640,458	4,678,196
July	.....	10,844,164	9,593,592	4,928,540
August	.....	10,407,049	9,660,357	4,908,445
September	.....	9,833,477	9,522,584	5,317,618
October	.....	9,009,675	10,015,260	6,165,452
November	.....	8,897,106	11,058,542	7,189,489
December	.....	9,381,718	11,547,286	7,806,220

STEEL CORPORATION POLICIES

Judge Gary Discusses Profiteering, Shipbuilding and Other Topics

At the annual meeting of the United States Steel Corporation, held in New Jersey, April 15, Judge Gary spoke informally of present conditions as affected by the war.

"We are expending something like $13,000,000 to $14,000,000 a month," he said, "for extensions to plants, mostly all for war purposes. The Government has never yet come to us and asked for an increase in the output of any necessary steel without our immediately commencing the necessary work. That is notwithstanding that construction costs are now two or three times higher than normal. These extra expenses we are charging out of earnings.

"It is fortunate that the Government has fixed prices which permit us to make fair profits and pay large dividends, temporarily, at least. If we were profiteering we would have opportunity to pile up these profits as surplus; but we feel that we are living up to the policy outlined by the President of the United States when he said that prices should be large enough to pay living wages to the workers, fair salaries to officials and provide for necessary plant additions for war work."

First Ship Near Completion

Judge Gary said that the shipbuilding was progressing satisfactorily. The first ship would be launched next month, probably before May 15, and it would be completed by the middle of July.

"Thereafter," he added, "the schedule calls for the completion of a ship from the Newark yards and another from the new Mobile plant every 20 days. In other words, the Corporation's output of vessels will be a ship every 10 days.

"We did not intend to enter the shipbuilding field. It was outside our line of business, but a gentleman interested in Governmental affairs came to us and asked if we could not undertake the work, since ships were so urgently needed. After a careful study we decided that we could at least build ships as cheaply, as rapidly and get into the business as quickly as any one else. The Mobile yard is a duplicate of the one on the Hackensack River, each having 10 ways.

"We are forging steel for the Government and making various kinds of steel that go into munitions. We think we are making some progress in the direction which you would approve. It would be improper for me to tell you the extent to which our plants are engaged on Government work, but I may say that it is very large, and an indication that we are succeeding is contained in the fact that we have received no complaints from the Government. In respect to conditions when the war ends, all I may say is that we are preparing for whatever may appear in the way of trade developments."

An Employee Speaks

E. R. Smith, an employee at the Dover, Ohio, plant of the American Sheet & Tin Plate Co., spoke as an employee and also as a stockholder, telling of the improvement in conditions of employees during the past 12 years owing to the efforts of the Corporation.

Following Mr. Smith's remarks, Judge Gary said that the interests of employees are uppermost in the minds of the officers and directors of the Corporation. "To have received and deserved the appreciation of our employees," he added, "is worth living for. First of all we intend to treat our workers liberally. In treating them fairly we are serving the stockholders and doing the best thing for the Corporation."

Henry C. Frick, James H. Reed, Percival Roberts, Jr., and Robert Winsor were re-elected directors.

The transfer books of the Corporation, which are open for public inspection, disclosed a shrinkage in brokers' holdings and large increases in holdings of investors. Woodrow Wilson of Princeton, N. J., was included in the list as the owner of 47 shares of preferred stock.

Iron and Steel Markets

NEW PLATE MILL RECORD

Will Overtake Shipyard Deliveries in May

Government and Steel Corporation Co-operate on Great Gun Plant

Plate mills, put to a test of their ability to supply the shipyards, have shown remarkable outputs, more than 110,000 tons of plates having been turned out in one April week. At this rate the mills will be caught up on shipyard deliveries early in May. The coming of Charles M. Schwab into the Government service as director general of the Emergency Fleet Corporation will mean a further speeding of effort that is full of promise.

This week most plate mills are running 100 per cent on Government and Ally work, save such part of their product as in ordinary practice cannot meet ship requirements. Great Britain is getting 5000 tons of plates a week to apply on the 300,000 tons her yards are to have in return for British advances of munitions and other steel to the American army in France.

Definite moves will be made this week on the project for the greatest American gun plant, which the Government and the Steel Corporation will carry out in co-operation, the latter building the steel works. The Pittsburgh district is a suggested location and a great projectile plant is to be included. The largest machine ship in the country will be provided.

Important steel companies in the Central West have notified their customers that they must concentrate on Government work for the time being, a 30-day period being named in some cases. There is a closer sifting all along the line, among both producers and consumers of steel, of Government work from commercial work, and the amount of the latter is steadily decreasing.

Car awards are still delayed, to the jeopardizing of deliveries of fuel and all war material later in the year. The proposal is now to build many more cars of wood than has been planned. In view of the new designs, few cars can now be had before August.

The situation has been complicated by the appeal of the Shipping Board to the Railroad Administration to cut down substantially the tonnage of plates it has been figuring on for cars, namely, 575,000. The Shipping Board's claim that the use of that amount of plates in cars will seriously interfere with the ship program is strongly disputed by steel makers.

How much bridge and building work has dwindled is indicated in the March statistics of the Bridge Builders and Structural Society. Less than 85,000 tons of such work was placed last month, against a theoretical capacity of 180,000 tons. This is the first time in seven or eight years that the March volume of business has been less than that of January or February and clearly indicates that no special activity is planned for the building season.

War necessities, however, continue to develop and for extensions to its Harrison and Syracuse plants the Crucible Steel Co. of America has closed for 9500 tons of steel, while about 8000 tons is active at the moment in the East. Included is 3600 tons for elevated railroad extension in Brooklyn for which the Bethlehem Steel Bridge Corporation is the low bidder. All of 7500 tons will be required for 1,100,000 angle stakes for wire entanglements for the Army.

Cotton tie prices for 1918 have just been announced, with no effort to gloss over the fact of a uniform price. At $1.90 per bundle of 45 lb. the new price is $4 a ton below the 1917 basis, being in harmony with the fixed prices on other forms of steel.

Wire mills are being adjusted to a lessened scale of operations, some 50 per cent and some 60 or 70 per cent, in view of the turning of so large a part of the steel ingot supply to war needs. The long-pending 60,000 tons of barb wire for Italy has been placed—25,000 tons to one company, 18,000 tons to another, 9000 tons to a third, with 8000 tons divided among three.

The War Industries Board is urging the Railroad Administration to take Bessemer steel rails instead of open hearth as far as possible for this year's renewals, so that all the open-hearth steel needed may be available for shells and other war requirements. Somewhat lighter rail sections are also suggested so as to conserve steel. With expected pruning, the total of domestic rails called for this year may not exceed the total rollings of 1917, which included some large export orders.

There has been some commotion over the payment of commissions by consumers on pig iron bought through merchant firms. A ruling has been made at Washington forbidding the payment of pig-iron commissions.

Tin consumers in all lines have been called to Washington for daily conferences this week. Conservation of tin is reported to be under discussion, but the trade considers that something more than this is in hand. Prices for future delivery have been soaring and the quantity offered constantly grows less.

Pittsburgh

PITTSBURGH, April 16—(*By Wire*).

Continued improvement in car supply, which seems to be fast getting back to normal, and the fixing of the price on cotton ties for the 1918 season at $1.90 per bundle, or $4 per ton less than last year, are the principal items of interest that developed in the local steel trade in the past week. Reports from coke producers, blast furnace operators, and finishing mills agree that the supply of cars is steadily getting better and shipments in the past week were much heavier than in any similar period for more than six months. A leading steel interest reports that on three days last week it shipped more finished material than in any similar period for more than a year. The heavy stocks of finished steel products piled in mill warehouses during the extremely cold weather and the car congestion are very rapidly being reduced.

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	Apr. 16 1918	Apr. 10 1918	Mar. 20 1918	Apr. 18 1917
No. 2 X, Philadelphia	$34.25	$34.25	$34.25	$42.00
No. 2, Valley furnace	33.00	33.00	33.00	40.00
No. 2 Southern, Cincinnati	35.90	35.90	35.90	37.90
No. 2, Birmingham, Ala.	33.00	33.00	33.00	35.00
No. 2, furnace, Chicago*	33.00	33.00	33.00	39.00
Basic, deliv., eastern Pa.	32.75	32.75	33.75	38.00
Basic, Valley furnace	32.00	32.00	33.00	40.00
Bessemer, Pittsburgh	36.15	36.15	37.25	42.95
Malleable, Chicago*	33.50	33.50	33.50	39.00
Malleable, Valley	33.50	33.50	33.50	40.00
Gray forge, Pittsburgh	32.75	32.75	32.75	38.95
L. S. charcoal, Chicago	37.50	37.50	37.50	41.75
Rails, Billets, Etc., Per Gross Ton:				
Bess. rails, heavy, at mill	55.00	55.00	55.00	38.00
O.-h. rails, heavy, at mill	57.00	57.00	57.00	40.00
Bess. billets, Pittsburgh	47.50	47.50	47.50	75.00
O.-h. billets, Pittsburgh	47.50	47.50	47.50	75.00
O.-h. sheet bars, Pittsburgh	51.00	51.00	51.00	77.50
Forging billets, base, P'gh.	60.00	60.00	60.00	100.00
O.-h. billets, Philadelphia	50.50	50.50	50.50	75.00
Wire rods, Pittsburgh	57.00	57.00	57.00	85.00
Finished Iron and Steel,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia	3.685	3.685	3.685	3.659
Iron bars, Pittsburgh	3.50	3.50	3.50	3.50
Iron bars, Chicago	3.50	3.50	3.50	3.25
Steel bars, Pittsburgh	2.90	2.90	2.90	3.75
Steel bars, New York	3.095	3.095	3.095	3.919
Tank plates, Pittsburgh	3.25	3.25	3.25	6.00
Tank plates, New York	3.445	3.445	3.445	6.169
Beams, etc., Pittsburgh	3.00	3.00	3.00	4.00
Beams, etc., New York	3.195	3.195	3.195	4.169
Skelp, grooved steel, P'gh.	2.90	2.90	2.90	5.25
Skelp, sheared steel, P'gh.	3.25	3.25	3.25	5.50
Steel hoops, Pittsburgh	3.50	3.50	3.50	4.25

*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

Sheets, Nails and Wire Per Lb. to Large Buyers:	Apr. 16 1918 Cents	Apr. 10 1918 Cents	Mar. 20 1918 Cents	Apr. 18 1917 Cents
Sheets, black, No. 28, P'gh.	5.00	5.00	5.00	5.75
Sheets, galv., No. 28, P'gh.	6.25	6.25	6.25	7.50
Wire nails, Pittsburgh	3.50	3.50	3.50	3.20
Cut nails, Pittsburgh	4.00	4.00	4.00	3.75
Fence wire, base, P'gh.	3.25	3.25	3.25	3.15
Barb wire, galv., P'gh.	4.35	4.35	4.35	4.05
Old Material: Per Gross Ton:				
Carwheels, Chicago	$29.00	$29.00	$30.00	$24.00
Carwheels, Philadelphia	29.00	29.00	30.00	26.00
Heavy steel scrap, P'gh.	28.50	28.50	30.00	27.00
Heavy steel scrap, Phila.	28.00	28.00	29.00	25.00
Heavy steel scrap, Chicago	28.50	29.00	29.50	27.50
No. 1 cast, Pittsburgh	29.00	29.00	30.00	24.00
No. 1 cast, Philadelphia	29.00	29.00	30.00	27.00
No. 1 cast, Chicago, net ton	27.50	27.50	27.50	20.75
No. 1 RR. wrot., Phila.	34.00	34.00	35.00	36.00
No. 1 RR. wrot., Ch'go, net	30.36	30.36	30.75	30.00
Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt	$6.00	$6.00	$6.00	$7.50
Furnace coke, future	6.00	6.00	6.00	8.00
Foundry coke, prompt	7.00	7.00	7.00	9.50
Foundry coke, future	7.00	7.00	7.00	9.00
Metals				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York	23.50	23.50	23.50	30.50
Electrolytic copper, N. Y.	23.50	23.50	23.50	30.50
Spelter, St. Louis	6.75	6.75	7.37½	9.50
Spelter, New York	7.00	7.00	7.62½	9.75
Lead, St. Louis	6.80	6.90	7.10	9.20
Lead, New York	6.95	7.00	7.25	9.40
Tin, New York	87.00	85.00	85.00	55.25
Antimony (Asiatic), N. Y.	12.75	12.75	13.25	34.50
Tin plate, 100-lb. box, P'gh	$7.75	$7.75	$7.75	$8.00

Most of the leading steel companies in the Pittsburgh, Youngstown, Wheeling and other districts put into effect on April 15 the 15 per cent advance in wages announced two weeks ago by the United States Steel Corporation, which also went into effect on the same date. There is still a shortage in the supply of labor at nearly all manufacturing plants, but it seems to be more acute in common labor. When the very hot weather comes thousands of men working around blast furnaces and steel mills, doing common labor, seek outdoor employment to get away from the heat. All the steel companies have committees hard at work selling Liberty bonds, and some splendid records are being made. Many plants report 100 per cent subscriptions, every man in some departments buying one or more bonds.

The demand for steel products from the general trade is very dull, the Government taking more and more of the output. Of plates alone it is taking 85 to 90 per cent of all being turned out.

Pig Iron.—Two sales of Bessemer iron are noted, one of 2500 tons, deliveries 500 tons a month, April to August, inclusive, and the other 1500 tons, equal deliveries over last half of the year. The 2500 tons was sold to a concern making war essentials, and the sale was made by the furnace strictly as a patriotic measure, as the seller really did not have the iron to spare. There is still an acute shortage in the supply of Bessemer and basic pig iron, especially the latter, and it does not seem that this shortage will be relieved for some time. In regard to the reported dispute as to the base price of iron, it is said officially that the base price on which pig iron differentials are figured is $33 at furnace. This happens to be the price of foundry iron, but at the same time differentials are not figured on the price of foundry iron, but on $33 at furnace. Should pig iron prices be changed for third quarter the figure, $33, will probably still be the basis on which differentials will be based. Large accumulations of Bessemer iron, stored at seaboard, waiting for boats, mostly consigned to France and Italy, have been resold to consumers in this country. A leading consumer making railroad supplies bought a large part of this Bessemer iron. The remainder was divided among smaller consumers and it is now claimed that the resale iron has all been cleaned up. It is expected that the output of pig iron in April will be fully as heavy as in March, and it may be larger, as the supply of coke all this month has been very good and no furnaces in this district have suffered severely for lack of it. Prices for second quarter are as follows:

Basic pig iron, $32; Bessemer, $35.20; gray forge, $32; No. 2 foundry, $33; No. 3 foundry, $32.50, and malleable, $33.50, all per gross ton at Valley furnace, the freight rate for delivery in the Cleveland and Pittsburgh districts being 95c. per ton.

Billets and Sheet Bars.—There is an acute shortage in the supply of sheet bars, and consumers who are suffering for steel report they have combed the market everywhere, but cannot find any bars. One large sheet mill in the Youngstown district will be idle all this week for lack of bars. The Government is taking more and more of the output of basic steel from the mills, and Bessemer is being substituted for open hearth when possible. The outlook is that there will be a shortage in supply of steel for some months. Deliveries of steel by the mills are fairly good, but they are diverting more and more of their product to Government needs and are compelled to cut down in the quantities of steel being shipped to regular customers.

We quote 4 x 4 in. soft Bessemer and open-hearth billets at $47.50, sheet bars $51, forging ingots $73, and forging billets $60 base, all f.o.b. at mill, Pittsburgh or Youngstown.

Ferroalloys.—New inquiry for ferromanganese and spiegeleisen, especially the latter, is very heavy. Quotations on spiegeleisen are nearly all made now on the new standard of 16 to 18 per cent recently adopted by sellers, which is $70 at furnace, either for delivery in second quarter or in last half of this year. There is an inquiry out for 1000 tons of spiegeleisen, two for 500 tons each, and another for 1000 tons, nearly all

for second half of the year delivery. For 20 per cent, $77 at furnace is quoted, this being on the basis of $3.50 per unit advance over 16 to 18 per cent. Prices on 70 per cent ferromanganese are very firm at $250, delivered, with $4 per unit advance being charged for 80 per cent, making it $290 delivered. The market is very strong at these prices. Consumers are well covered for first half and most of the new inquiry is for second-half delivery. There is a shortage in the supply of 50 per cent ferrosilicon, and it is very firm at $175, at furnace, but most furnaces absorb the freight to point of delivery.

We now quote 9 per cent Bessemer ferrosilicon at $54, 10 per cent $55, 11 per cent $58.30, 12 per cent $61.60. We quote 6 per cent silvery iron $40, 7 per cent $42, 8 per cent $44.50, 9 per cent $47, 10 per cent $50. Three dollars per gross ton advance for each 1 per cent silicon for 11 per cent and over. All the above prices are f.o.b. maker's furnace, Jackson or New Straitsville, Ohio, these furnaces having a uniform freight rate of $2 per gross ton, for delivery in the Pittsburgh district.

Steel Rails.—A continued active demand for light rails from the coal mining and lumber interests, especially the latter, is noted. Nothing is being done in standard sections, but the mills are filled for this year, while the obligations of the Carnegie Steel Co. will take its entire output of light rails and standard sections over the first half of next year. The Government is expected to place some heavy orders for standard sections in the near future for railroads that need rails badly to give efficient service. The Government price on 25 to 45 lb. sections is $3 per 100 lb. f.o.b. Pittsburgh. There is no official price on standard sections.

Structural Material.—Very little domestic work is being placed or is under way. Nearly all the fabricated steel work being turned out by the large companies such as the American Bridge Co., the McClintic-Marshall Co., the Fort Pitt Bridge Works, and others is on direct Government orders for structures to be built in this country or in France. The McClintic-Marshall Co. and the Fort Pitt Bridge Co. are filling large contracts for fabricated steel works to be erected in France. The Chesapeake & Ohio Railroad has an inquiry out for 1400 tons of bridge work. We quote beams and channels up to 15 in. for this quarter at 3c., Pittsburgh.

Plates.—The expected Government order for cars was to have come out on Monday, April 15, but the letting has been postponed until Wednesday, this week, and it is not known whether it will be placed at that time or not. No inquiries of moment for cars are in the market and the car builders say they do not look for these under present Government operation of the railroads. It is said that the Government is taking very close to 90 per cent of the entire output of plates, but some of the smaller mills are reported to have limited quantities of universal and sheared plates for delivery within three or four months from date of order. We quote ¼-in., and heavier sheared plates at 3.25c., at mill Pittsburgh, for this quarter.

Iron and Steel Bars.—Mills report a fairly active demand for both iron and steel bars, but a very large part of the new buying is from the Government for various work it has under way in this country and in France. Implement makers are said to be specifying quite freely on contracts for steel bars. Prices for this quarter are as follows: Steel bars rolled from steel billets, 2.90c.; from old steel rails, 3c. and refined iron bars 3.50c. in carloads f.o.b. Pittsburgh.

Sheets.—A very serious shortage has developed in the supply of sheet bars and this is cutting down output of sheets to some extent. A leading sheet mill in the Youngstown district will be down all this week for lack of sheet bars. In spite of this condition, the sheet mills are making a fairly good record in operation, the independent mills now running at a rate of 75 per cent or more. However, the leading interest which produces about 50 per cent of all the sheets made is not operating to more than 60 per cent of capacity. The Government is still placing very heavy orders for sheets for work in this country and in France, and at present over 80 per cent of the total output of black and galvanized sheets is said to be going to the Government, on direct or indirect orders. The demand from the general trade is quiet, but most consumers are covered for several months, and few mills have any tonnage in sheets to spare for delivery before July. Every day large Government orders for sheets are distributed among the mills, the demand being insistent and steadily growing larger. Government prices on sheets in effect for second quarter are given on page 1033.

Tin Plate.—Mills report the car supply as steadily getting better and the heavy stocks of tin plate piled in mill warehouses during the winter weather and car congestion are being steadily reduced. Some large inquiries for tin plate for second quarter delivery are being received by the mills from trade that has not covered. Some of these are quoted on, while other mills ask that the business be held up until a later date. There is some foreign inquiry for tin plate, mostly from the Orient, and some from South America. The average rate of operations among the tin plate mills was about 92 per cent in March, but it is expected to reach 95 per cent or higher this month. There is still a shortage in the supply of pig tin and steel, and this is keeping down output of tin plate to some extent. It is said indications are strong that the tin plate mills, with the splendid co-operation they have given the Government for many months, will be able to fully meet the demand of this country for tin plate for food containers and will also be able to supply the 5,000,000 boxes for France, which the mills some time ago agreed to furnish that country during this year. We quote tin plate at $7.75 per base box up to June 30, rolled from Bessemer or open-hearth stock. Prices on terne plate are given on page 1033.

Cotton Ties.—The cotton tie season opened Monday, April 15, much earlier than last year. Prices have been fixed on the basis of $1.90 per bundle of 45 lb. for lots of 3000 bundles and over; for lots of 1000 bundles and up to but not including 3000 bundles the price is $1.92 f.o.b. Pittsburgh. The above prices are for April shipment. For May, 1c. additional carrying charge over above prices is to be made, and 3c. for June. Many consumers of cotton ties have already closed for their supply, shipment of one third of their needs to be made in April, May and June. The above prices on cotton ties are referred to by the makers as being in harmony with prices on other rolled steel products, and are $4 per ton less than the 1917 prices. We also note that above prices are maximum. Makers of cotton ties are Sharon Steel Hoop Co., Pittsburgh Steel Co., Carnegie Steel Co., Atlanta Steel Hoop Co., Laclede Steel Co., and Gulf States Steel Co.

Skelp.—Mills that buy skelp in the open market report that it cannot be had, the mills being sold up for four to six months, and are not in position to take on any more orders.

We quote grooved skelp at $2.90; universal skelp, $3.15, and sheared skelp, $3.25 base. Special skelp for boiler tubes, etc., is $3.40 for base sizes and $3.55 for other sizes, all prices being per 100 lb., f.o.b. Pittsburgh.

Wrought Pipe.—The mills rolling iron and steel pipe are practically sold up for this year on lap weld, but on butt weld some mills can ship out in 60 to 90 days on some sizes, but on other sizes are sold up four months or longer. The Government is buying some pipe now and then, but has not placed any large orders for some time. It seems that any gas or oil projects involving large quantities of line pipe must go over until next year, as none of the mills has any room left to take on any large orders for line pipe and make the delivery in time so that the lines could be laid this year. Discounts on iron and steel pipe in effect for this quarter are given on page 1033.

Boiler Tubes.—Conditions in the tube trade are the same as they have been for some months. Mills rolling iron and steel tubes are sold up largely for this year, mostly on Government work, and several of the larger makers of iron and steel boiler tubes and seamless steel tubing have obligations that will take their output from now until probably the end of the first half of next year. Discounts on iron and steel tubes for this quarter are given on page 1033.

Coke.—Producers of coke and also blast furnace

operators report the supply of cars is steadily better, and deliveries of coke to the furnaces are nearly back to normal; on the first three days of last week there was a 100 per cent supply of cars in the coke region, but on the last three days it dropped down to about 70 per cent. A Shenango Valley blast furnace interest has bought a considerable tonnage of by-product coke from a Youngstown maker on the basis of $7.35 per net ton, delivered at the furnace, and is giving basic iron in exchange for it at $32 at maker's furnace. Owing to the increased output some free coke is available occasionally, but this is quickly picked up and at regular prices. The coke works are making better time in operation than for some months, and the supply of labor is reported good. We quote 48-hr. blast furnace coke at $6, 72-hr. foundry coke at $7, and crushed coke from 1-in. size at $7.35, all in net tons at oven. *The Connellsville Courier* gives the output of coke in the Upper and Lower Connellsville regions for the week ending April 6 as 333,065 tons, a decrease from the previous week of 29,370 tons. This was caused by the Easter holiday on March 31. Some of the coke workers did not report for duty for two or three days, thus cutting down the output very materially.

Wire Products.—The order for 40,000 kegs of wire nails wanted by the Navy has all been placed with the Pittsburgh Steel Co., deliveries running over the remainder of this year. The Government has also placed 60,000 tons of barbed wire for shipment to Italy, deliveries running over the remainder of this year. This barbed wire is of a special style of make, having longer barbs, and closer together than the ordinary barbed wire. It is also to be painted gray and on account of its special character, a differential of 20c. is being paid, which makes the price $3.95 per 100 lb. The price of ordinary painted barbed wire is $3.65 per 100 lb. f.o.b. Pittsburgh. Of this order, it is stated that the American Steel & Wire Co. took 25,000 tons, Pittsburgh Steel Co., 18,000 tons; the Jones & Laughlin Steel Co., 9,000 tons; the Youngstown Sheet & Tube Co., 4,000 tons; the Gulf States Steel Co., 2,000 tons, and the Kokomo Steel & Wire Co., 2,000 tons. The domestic trade for wire and wire nails is said by local mills to be fairly active, and they further state their obligations are now large enough to take about all the wire and wire nails they can make over the next three or four months with the present limited rate of output, this being due to the fact that some mills are not able to get enough steel to operate to more than 60 per cent. None of the local mills has very much wire or wire nails to spare on new orders for delivery before July. It is claimed that there has been absolutely no cutting in prices in this district. Prices in effect on wire products for second quarter are given on page 1033.

Cold-Rolled Strip Steel.—The demand from the general trade is only fair, but the Government is placing a fairly large quantity of strip steel, which is divided among the different mills. Some of this is going to France for Government work in that country. Due to shortage in steel, and partly to lack of new demand, mills rolling cold-rolled strip steel are operating to no more than 60 per cent, and some at a less rate. Large stocks piled in mill warehouses during the cold weather and car congestion are moving out freely, as the car supply is steadily getting better. It is claimed prices as fixed by the Government for second quarter are not being shaded.

We quote cold-rolled strip steel at $6.50 per 100 lb., f.o.b. Pittsburgh, terms 30 days, less 2 per cent cash in 10 days, when sold in quantities of 300 lb. or more.

Hot-Rolled Strip Steel.—Makers report the demand only fair, due to the falling off in business of cold-rolled strip steel. Present output is not more than 50 per cent of capacity. The Government maximum price is $4.50 per 100 lb. f.o.b. Pittsburgh for second quarter, which price is shaded more or less.

Hoops and Bands.—A movement is under way to change the extras on bands on which steel bar card extras have applied, and use the hoop extras instead. It is believed that this may be done within a short time. Mills report the new demand for steel hoops for cooperage purposes is active and the demand for steel bands is also heavy. A very large part of the output of hoops and bands is going to the Government on direct and indirect orders. We quote steel hoops for cooperage purposes at $3.50, and steel bands at $2.90, extras on the latter as per the steel bar card, f.o.b. Pittsburgh.

Nuts and Bolts.—At the recent meeting of the Institute of Nut, Bolt and Rivet Manufacturers held in New York, a request was made to the Committee on Steel and Steel Products of the American Iron and Steel Institute that present discounts on nuts and bolts, and present prices on rivets be reaffirmed for second quarter. As yet no definite reply has been received by the manufacturers to their request, but it is looked for at any time. The manufacturers contended that with steel bars at 2.90c. base, the present prices on bolts, nuts and rivets allowed only a fair margin of profit and were satisfactory to consumers. The Government is taking 80 per cent or more of the output of nuts and bolts, the demand from the general trade having been very dull for some months. Discounts on nuts and bolts, which are likely to be reaffirmed for second quarter are given on page 1033. We note, however, that on some recent orders, prices on nuts and bolts have been shaded from 5 to 10 per cent.

Rivets.—The demand for rivets from the shipbuilding industry is very heavy, and it is said the Government is taking fully 75 to 80 per cent of the entire output, either on direct or indirect orders. The demand from the general trade is very dull. Government prices are still being quoted, these being $4.65 for structural rivets, and $4.75 for cone-head boiler rivets, per 100 lb. f.o.b. Pittsburgh.

Spikes.—The demand for small spikes for Government purposes, especially from the shipbuilding industry, is extremely heavy and all the makers of small spikes are sold up for three or four months or longer. The demand for railroad spikes is dull, none of the railroads having placed any large orders for some time. Prices as reaffirmed for second quarter are as follows:

Standard sizes of railroad spikes 9/16 x 4½ in. and larger, $3.90 per 100 lb. in lots of 200 kegs of 200 lb. each, or in larger lots. Boat spikes, $5.25 per 100 lb.; track bolts, $4.90 base in lots of 200 kegs or more; less than 200 keg lots, $1 per 100 lb. extra. All f.o.b. Pittsburgh.

Shafting.—The Government is still placing fairly large orders for shafting, taking probably 60 per cent or more of the present limited output and the demand from the automobile builders and the screw stock trade is also reported slightly better. The supply of cars is steadily getting larger, and the heavy stocks of shafting piled in mill warehouses are being very rapidly reduced. We quote cold-rolled shafting at 17 per cent off list in carload, and 12 per cent in less than carload, f.o.b. Pittsburgh.

Old Material.—The much-mooted question of whether legitimate scrap dealers are to be allowed a commission of 3½ per cent on scrap they obtain and sell to consumers seems to be as far from definite settlement as when the question first came up. Local scrap dealers are absolutely in the dark in the matter, and say they have no idea of what is to be done. At the same time, it is a fact that a large consumer of scrap not in the Pittsburgh district has received a letter from the War Industries Board stating that it was never the intention of the Steel and Steel Products Committee of the American Iron and Steel Institute or of the War Industries Board to alter the method of doing business in the scrap trade. However, so far as known, this is the only concern that has received such a letter, and there seems to be a misunderstanding all around as to just what construction has been put on this question of commission by the War Industries Board. In any event, the scrap dealers feel they have not received fair treatment in the matter, and possibly the next step will be to have a committee from the American Board of Scrap Iron Dealers go to Washington with the proper evidence, and lay this matter before the War Industries Board for definite decision. The scrap dealers feel they are absolutely essential to the successful carrying on of the steel business, in spite of the fact that there seems to be a disposition in some quarters to take an opposite view. Some definite action in this important

matter is certain to be taken by the scrap trade within a very short time. In the meantime sales of scrap by dealers to consumers are very few, dealers doing only such business as they feel it is necessary to put through in order to hold their trade. Nearly all dealers had more or less scrap business on their books before the Government fixed prices, some of which is still unshipped, and they are giving most of their attention to this. Some few sales of scrap are being made by dealers on which they say they are realizing no profit. One such sale was 2000 tons of cast-iron borings, and 2,000 tons of turnings, both at $19 delivered in the Pittsburgh district, which is the regular Government price on these materials. Most dealers are not trying to do business, simply awaiting the outcome of the commission question.

Prices on iron and steel scrap, effective from April 1, nearly all of which have been fixed by the Government, for delivery in Pittsburgh and other points that take Pittsburgh freight, are as follows:

Heavy steel melting scrap, Steubenville, Follansbee, Brackenridge, Monessen, Midland and Pittsburgh, delivered	$28.50 to $29.00
No. 1 cast (for steel plants)	29.00
Rerolling rails, Newark and Cambridge, Ohio, Cumberland, Md., Franklin, Pa., and Pittsburgh	33.50 to 34.00
Hydraulic compressed sheet scrap	24.00 to 25.00
Bundled sheet scrap, slides and ends, f.o.b. consumers' mill, Pittsburgh district	23.00 to 24.00
Bundled sheet stamping scrap	21.00 to 22.00
No. 1 railroad malleable stock	28.00 to 29.00
Railroad grate bars	18.00 to 19.00
Low phosphorus melting stock	38.00 to 39.00
Iron car axles	46.00 to 46.50
Steel car axles	46.00 to 46.50
Locomotive axles, steel	46.00 to 46.50
No. 1 busheling scrap	26.00 to 27.00
Machine shop turnings	18.50 to 19.00
Cast iron wheels	28.00 to 29.00
Rolled steel wheels	34.00 to 36.00
*Sheet bar crop ends	38.00 to 39.00
Cast iron borings	18.50 to 19.00
No. 1 railroad wrought scrap	33.00 to 34.00
Heavy steel axle turnings	23.00 to 24.00
Heavy breakable cast scrap	28.00 to 29.00

*Shipping point.

Chicago

CHICAGO, April 15 (*By Wire*).

The degree to which the Government is absorbing the capacity for plates and shapes is indicated by the fact that it wants 100 per cent of the production of the leading local independent. Furthermore, it is taking more of the plates heretofore rejected and which, classed as of tank quality, helped to appease the demand from general consumers. More than at any time heretofore materials must be for Government use or the mills cannot attempt to supply them. Under the circumstances, consumers can depend only on their old sources of supply. They know it is useless to look elsewhere. Mill shipments are good and production is all that could be expected. The sales offices of Eastern mills have little to offer aside from their various specialties.

Pig iron is tighter than ever with Southern producers hampered by a lack of cars for making shipments and for the delivery of their own raw material. They are piling iron, most of it sold, because they cannot ship. No foundries hereabouts are actually without iron, though delayed shipments do not contribute to the peace of mind of their managers. A shortage in ferromanganese is believed to be inevitable, especially in view of the fact that the Government will permit the importation of only about half the 600,000 tons of Brazilian manganese ore which can easily be used in a year. Greater dependence must be placed on domestic ore. The consumers of sheets are getting only a part of what they want, Government needs looming larger here also.

Bolt and nut makers have favored a reaffirmation of existing prices. A decision is hoped for following meetings continued in New York this week. Meanwhile large Government contracts are in abeyance.

Pig Iron.—The iron situation, in point of supply, is tighter than ever, but no complaint is heard of melters being actually without iron so far as their current operations are concerned, and belief is general that most of them are well cared for. The producers and sellers set out to fully supply their regular customers and are doing so, though they are hindered in some cases by the failure of shipments to arrive at the proper time. Very little iron is offered for sale and would-be buyers in other territories who apply here for relief are being disappointed every day. An Ohio company failed to place 200 tons of basic in Chicago. When 500 tons of Southern iron 4.25 to 4.75 per cent silicon was offered to two implement makers, it was grabbed, and 5000 tons could have been placed as easily as the 500. Some prompt off-grade Southern iron is being offered and it is about the only iron that can be had in a hurry. For last half shipment a limited tonnage of 1.75 to 2.25 per cent silicon is available. When the transportation situation is better it is probable that Southern makers will resume the selling of higher grades. The shipping situation is so bad that several Southern producers are piling iron. The South needs more cars not only for iron shipments but to supply itself with raw material. The erection of powder, nitrate and shipbuilding plants in the South makes the future labor supply most dubious. Meanwhile the inquiry for last-half foundry iron keeps up and for malleable there is persistent call.

The following quotations are for iron delivered at consumers' yards, except those for Northern foundry, malleable Bessemer and basic irons, which are f.o.b. furnace, and do not include a switching charge averaging 50c. per ton:

Lake Superior charcoal, Nos. 2 to 5	$37.50
Lake Superior charcoal, No. 6 and Scotch	40.00
Northern coke foundry, No. 1	33.50
Northern coke foundry, No. 2	33.00
Northern coke foundry, No. 3	32.50
Northern high-phosphorus foundry	33.00
Southern coke No. 1 foundry and No. 1 soft	38.50
Southern coke No. 2 foundry	37.00
Malleable	33.50
Basic	32.00
Low phosphorus (copper free)	53.00
Silvery, 7 per cent	44.54

Ferroalloys.—It is understood that the Government will not consent to the importation of more than 300,000 and possibly not more than 250,000 tons of Brazilian manganese ore in the remainder of this year, whereas the ferromanganese furnaces could well use 600,000 tons and because of this situation the reliance on domestic ore must be much more greater than at present. Business in ferromanganese is rather quiet, the trade waiting to see what turn events will take. There is but little prompt material now available and a shortage later on is regarded as inevitable. The quotation for 70 per cent is $250 delivered, plus $40 for each additional unit. Sixteen per cent spiegeleisen is quoted at $70, furnace, plus $3.50 for each unit. Bessemer ferrosilicon is exceedingly difficult to procure for any delivery. For 50 per cent ferrosilicon around $160 delivered is quoted.

Plates.—Of the product of the leading independent 100 per cent is asked for Government needs. Some rejected plates have been available for domestic users, but this meager source of supply is dwindling in view of the Governmental decision to take plates of tank quality to a greater extent. The Government needs all the plates the mills can produce. The official mill quotation is 3.25c., Pittsburgh or Chicago. Jobbers quote 4.45c. for plates out of stock.

Structural Material.—With the leading independent, at least, the demand of the Government for shapes is as sweeping as it is for plates. Meanwhile the demand for material for structural operations of a private character grows less and less. Only one letting is reported. The American Bridge Co. will fabricate 134 tons required for a boiler house for the Pillsbury Flour Mills Co., Minneapolis, Minn. The official mill quotation is 3c., Pittsburgh or Chicago, with jobbers quoting 4.20c. for material out of warehouse.

Bars.—Although the Government demand for bars is not as great as for other forms of rolled steel, it nevertheless is taking a considerable percentage. An Eastern producer which has been offering certain sizes in limited quantity finds its output pretty well taken up and is largely confining its business to various spe-

cialties. The easiest bars to procure are rail carbon or those produced from discarded shell steel, the makers of which are few. Rerolling rails have been coming out a little more freely. Reinforced concrete work, though now almost the only form of construction going on, is not of such proportions to create any great demand for bars. Bar iron is moving smoothly. We quote bars of discard shell steel at 3.02½c.; mild steel bars at 2.90c., Chicago or Pittsburgh; bar iron at 3½c., and rail carbon at 3c., Chicago. Jobbers quote:

Soft steel bars, 4.10c.; bar iron, 4.10c.; reinforcing bars, 4.10c., base, with 5c. extra for twisting sizes ½ in. and over and usual card extras for smaller sizes; shafting, list plus 10 per cent.

Sheets.—Of this product there is a pronounced scarcity, with the Government demand for the heavier gages steadily growing. So far as possible the mills are caring for their regular customers, but few of these get all they ask for. In printed form, a new standard differential schedule arranged by the Subcommittee on Sheet Metal of the American Iron and Steel Institute is now at hand. It includes automobile and electrical sheets, roofing, etc. We quote No. 10 blue annealed at 4.25c.; No. 28 black at 5c., and No. 28 galvanized at 6.25c., all Pittsburgh.

We quote for Chicago delivery out of stock, regardless of quantity, as follows: No. 10 blue annealed, 5.45c.; No. 28 black, 6.45c., and No. 28 galvanized, 7.70c.

Old Material.—The liquidation of scrap which was in progress a week ago has about subsided and the present status of the market is one of inactivity, with the prospects strong for a revival of activity in the near future. At the rate at which mills are operating, they cannot go long without re-entering the market. Dealers have but little inclination to buy mixed scrap in view of the small margin of profit offered them by existing market levels. Strict Government specifications cause much rejection of steel, which gives the mills more than the ordinary amount of material for remelt and this is a factor against extensive buying. Railroads in this territory have been offering rerolling rails a little more freely and the rails are eagerly taken. Several railroads have issued lists of old material, but the aggregate is not great. Among them are the Chicago & Great Western, Wabash and Great Northern. A question has arisen on which the trade would like an official ruling. It concerns the classification of steel angle bars, which some would class with heavy melting steel or short rails.

We quote for delivery in buyers' yards, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton	
Old iron rails	$38.00 to $39.00
Relaying rails	60.00
Old carwheels	29.00
Old steel rails, rerolling	34.00
Old steel rails, less than 3 ft	34.00
Heavy melting steel	28.50 to 29.00
Frogs, switches and guards, cut apart	29.00
Shoveling steel	27.50 to 28.00
Steel axle turnings	21.50 to 22.50
Per Net Ton	
Iron angles and splice bars	$34.21
Iron arch bars and transoms	39.50 to 40.50
Steel angle bars	30.00 to 31.00
Iron car axles	41.52
Steel car axles	41.52
No. 1 railroad wrought	30.36
No. 2 railroad wrought	28.00 to 28.50
Cut forge	28.00 to 28.50
Pipes and flues	23.00 to 23.50
No. 1 busheling	25.50 to 26.00
No. 2 busheling	17.25 to 17.75
Steel knuckles and couplers	30.36
Coil springs	30.36
No. 1 boilers, cut to sheets and rings	21.00 to 22.00
Boiler punchings	32.00 to 33.00
Locomotive tires, smooth	38.50 to 39.50
Machine-shop turnings	15.75 to 16.25
Cast borings	15.75 to 16.25
No. 1 cast scrap	27.00 to 27.50
Stove plate and light cast scrap	22.50 to 23.00
Grate bars	22.00 to 23.00
Brake shoes	23.00 to 24.00
Railroad malleable	28.25 to 28.75
Agricultural malleable	27.50 to 28.50
Country mixed scrap	19.50 to 20.00

Bolts and Nuts.—Representatives of this trade, with representatives of the American Iron and Steel Institute and the War Industries Board, are reported as still in session in New York this week endeavoring to arrive at an understanding as to a reaffirmation or revision of prices. The resultant action is of great importance inasmuch as large Government orders have been held up pending a decision. The bolt and nut people hope and believe that existing prices will be reaffirmed. For prices and freight rates see finished iron and steel f.o.b. Pittsburgh, page 1033. Jobbers quote:

Structural rivets, 5.50c.; boiler rivets, 5.60c.; machine bolts up to ⅞ x 4 in., 40 and 10 per cent off; larger sizes, 35 and 5 off; carriage bolts up to ⅞ x 6 in., 40 and 2½ off; larger sizes, 30 and 5 off; hot pressed nuts, square tapped, $1.05 off, and hexagon tapped, 85c. off per 100 lb.; coach or lag screws, gimlet points, square heads, 50 per cent off.

Wire Products.—There is nothing to note except that wire and wire products are more easily procurable than other forms of steel. We quote:

Nails, $3.50, Pittsburgh; plain fence wire, $3.25; painted barb wire, $3.65; galvanized barb wire, $4.35; polished staples, $3.65, and galvanized staples, $4.35.

Cast Iron Pipe.—Business is at a new low ebb. Twin Falls, Mont., will take bids April 18 on 900 tons.

Quotations per net ton, Chicago, are as follows: Water pipe, 4-in., $57.30; 6-in. and larger, $54.30, with $1 extra for Class A water pipe and gas pipe.

Rails and Track Supplies.—Action by the Government is awaited, railroad business now being Government business. We quote:

Standard railroad spikes, 4.11½c., Chicago. Track bolts, with square nuts, 5.11½c., Chicago. Tie plates, steel, 3.25c.; tie plates, iron, 3.75c., f.o.b. maker's mill. The base for light rails is 3c., f.o.b. maker's mill for 25 to 45-lb. sections, lighter sections taking Government extras.

Philadelphia

PHILADELPHIA, April 16.

Government work is absorbing the attention of steel companies and their representatives to such an extent that ordinary commercial business is almost totally ignored. A steel company which has had a policy of protecting its regular trade on quarterly contracts has made no such contracts for some time past, and is now making only occasional small shipments of such material as can be rolled along with Government orders. Plates for shipbuilding take first place in rolling mill schedules.

Pig Iron.—A meeting of Eastern pig iron distributers was held to-day (Tuesday) at the Manufacturers' Club for the purpose of forming an organization. The question of commissions on sales of pig iron was also discussed. The War Industries Board has ruled that no commission shall be paid by consumers which makes the delivered price of the iron more than the maximum figures permitted by the Government. In the present condition, furnaces have no difficulty in disposing of all the iron they can make, so most of them are not inclined to pay any commissions to brokers, as they freely do in normal times. Therefore, unless the consumer can pay a commission to the broker for obtaining the iron for him, the latter is not in a position to make a profit at all, except, of course, where he is exclusive sales agent for one or more furnaces. Some of the owners of furnaces believe that the Government should permit the consumer to pay the broker a slight commission. They contend that the service that the broker performs under present conditions is one of buying and not of selling. It is almost certain that many consumers would gladly pay a commission if they could get the iron. The ruling of the War Industries Board does not permit them to do this, however, and there is no indication yet that the iron distributers, themselves, are willing to ask for a commission. Some of them believe that it would be bad policy to do so; in other words, that it would be establishing a precedent that might affect future relations between the furnaces and the distributers. The question is a delicate one and it is likely to disturb greatly existing conditions in the pig iron trade before it is settled. Whether the action taken by the War Industries Board against commissions is retroactive has not yet been made known. For several months after the Government pig iron price was announced, some distributors continued to collect their customary commission of 2½ per cent on foundry iron and 1 per cent on basic, this being charged, in addition to the price of the iron, as "service." During the past week, there has been no large selling of iron except

one lot of 15,000 tons of basic which was scheduled for an Eastern plate maker for last half shipment. Two large inquiries for standard low phosphorus are in the market, one for 10,000 tons, spread over the remainder of the year, with deliveries beginning in May, and the other is for 12,000 tons for last half. The former lot may be arranged for this week. A Lehigh Valley furnace company has disposed of about 90,000 tons of foundry iron within the past few weeks for last half delivery, and every purchaser was required to show that the iron was intended directly or indirectly for Government work. There is still an insistent demand for all grades of iron for immediate shipment and for last half, with none to be had in most instances. Several Pennsylvania companies on important Government work have been unable as yet to cover their requirements. The General Electric Co. is seeking about 13,000 tons of iron, mostly foundry grades. The Baldwin Locomotive Works is greatly in need of iron, and the same is true of the Cramp shipyard. A steel company has made a fruitless search in this district for basic iron. It asked for 500 to 1000 tons of iron weekly for 20 weeks, but could not obtain even a part of this quantity. The No. 1 furnace of the Thomas Iron Co., at Hokendauqua, Pa., will be blown in about May 1. Following are prices f.o.b. furnace for standard grades of iron, delivered prices being quoted on Virginia iron:

Eastern Pennsylvania No. 1 X	$34.50
Eastern Pennsylvania No. 2 X	33.50
Eastern Pennsylvania No. 2 foundry	33.00
Virginia No. 2 X (including freight)	36.77
Virginia No. 2 foundry (including freight)	36.27
Basic	32.00
Gray forge	32.00
Bessemer	35.20
Standard low phosphorus	53.00
Low phosphorus (copper bearing)	50.00

Coke.—There is a considerable improvement in the coke supply, and a number of furnaces will soon be ready to resume operations. For the first time in many months, a quantity of coke for prompt delivery has been sold in this market, a local company receiving 30 cars of blast furnace coke from a by-product oven. The coke was easily disposed of, though the surprising response was received from two or three furnaces to which it was offered that they had plenty of coke. We quote 48-hr. furnace coke at $6, Connellsville, and 72-hr. foundry coke at $7, Connellsville.

Ferroalloys.—While nothing definite has been done toward fixing 70 per cent as the Government standard for ferromanganese, the producers are generally selling on that basis, and are asking $250 for the 70 per cent and $4 per unit when the analysis runs higher. Spiegeleisen is firm at $70 for the 16 to 18 per cent, with $3.50 per extra unit. If shipment analyzed 20 per cent, the extra charge would be made, beginning at 17 per cent. A few small sales of ferromanganese have been made on the new basis.

Finished Iron and Steel.—Plates for shipbuilding take first place in all rolling mill schedules. An Eastern company has heeded the Government cry for more plates to the extent that it has increased production in its plate mills to 100 per cent, although by so doing it is robbing its other finishing mills of sufficient steel to operate at normal capacity. Another Eastern producer is shipping 5000 tons of plates weekly for the Hog Island shipyard alone, and if this is a fair criterion of what other plants are doing, it will not be long before the present shortage of plates for shipbuilding will be overcome. In fact, it would not be surprising if some signs of an overproduction of plates were seen within the next 60 days. Production at steel plants is showing an improvement. The Coatesville mills of the Midvale Steel & Ordnance Co. are working on a normal basis. Production of the Cambria Steel Co. at Johnstown is not yet fully up to normal, but an improvement is being noted there also. The Bethlehem Steel Co. is on a better production basis, but its blast furnaces are operating at only about 60 per cent of capacity. The structural material market is lifeless except for Government orders. The Government has placed an order for 10,000 tons of concrete reinforcing bars made from discard steel for use in the construction of warehouses and other buildings. Iron rolling mills are bettering their production somewhat, but are hampered by a scarcity of wrought iron. We quote plates at 3.25c., plain material at 3c., soft steel bars at 2.90c., No. 10 blue annealed sheets at 4.25c., No. 28 black sheets at 5c. and No. 28 galvanized sheets at 6.25c., all Pittsburgh, and bar iron at 3.685c., Philadelphia.

Billets.—There are no sales of rerolling billets, as steel plants are using all they can produce to keep their own finishing mills busy. We quote open-hearth rerolling billets at $50.50, Philadelphia.

Old Material.—Two steel companies of this district have written to the War Industries Board relative to the payment of a commission on purchases of iron and steel scrap, and they have received almost identical replies from Chairman Brookings that the board never discussed or contemplated any change in the method of selling scrap. One of these consumers says this was in direct reply to an inquiry as to whether it could pay dealers a commission, it having bought 10,000 tons of melting steel with the understanding that the commission would be paid if allowed by the War Industries Board. This consumer construes Chairman Brookings' letter to mean that there is no order to prevent the payment of a commission and it intends doing so. Meanwhile, the American Board of Scrap Dealers is preparing to present to the War Industries Board, through the Committee on Steel and Steel Products of the American Iron and Steel Institute, its petitions from consumers, numbering about 100, asking the board to legalize the payment of commissions by consumers to dealers in scrap. It is difficult for dealers to negotiate business, as holders of scrap are not willing to sell below the maximum prices. Hence there is no margin of profit for the dealer. Difficulties in shipping are getting worse instead of better, other freight being given preference over scrap, which can be shipped only by permit. There is a scarcity of heavy melting steel in the Pittsburgh territory and a very acute scarcity in this territory of wrought scrap. We quote for delivery at buyers' works in eastern Pennsylvania as follows:

No. 1 heavy melting steel	$28.00 to $29.00
Steel rails, re-rolling	34.00
No. 1 low phosphorus heavy, 0.04 and under	39.00
Low phosphorus, 0.04 and under	36.50
Low phosphorus (not guaranteed)	32.00 to 34.00
Old iron rails	39.00
Old carwheels	29.00
No. 1 railroad wrought	34.00
No. 1 yard wrought	33.00
Country yard wrought	29.00
No. 1 forge fire	25.00 to 26.00
Bundled skeleton	25.00 to 26.00
No. 1 busheling	31.00
No. 2 busheling	17.00 to 18.00
Turnings (for blast furnace use)	17.50 to 18.00
Machine shop turnings (for rolling mill use)	18.50 to 19.00
Cast borings (for blast furnace use)	17.50 to 18.00
Cast borings (clean)	19.00
No. 1 cast (for steel plant use)	29.00
No. 1 cast (cupola sizes)	32.00 to 33.00
Grate bars	23.00 to 24.00
Stove plate	23.00 to 24.00
Railroad malleable (for steel plants)	28.00 to 29.00
Railroad malleable (for malleable works)	31.00 to 32.00
Wrought iron and soft steel pipes and tubes (new specifications)	32.00 to 33.00
Ungraded pipe	29.00

Cast Iron Pipe.—Very little business is being done. Municipalities are prevented from buying because of inability to sell bonds. A large cast-iron pipe foundry is taking on other war work, such as castings for chemical plant equipment. Government prices are as follows: $53.85, Philadelphia, for 6-in. and heavier, and $56.85 for 4-in.; $63.85 for 3-in. and $1 additional for Class A and gas pipe.

Railroad Equipment.—Car manufacturers will make another trip to Washington on Wednesday for the purpose of concluding arrangements for the building of 100,000 freight cars for the Railroad Administration. The Railroad Administration is severely criticised by steel men for delaying the placing of these contracts, as it will be five months after the contracts are signed before deliveries of cars can be begun. This will bring deliveries late in the fall and a sufficient number of cars may not be built in time to prevent a recurrence of last winter's car shortage. The standardized car

will require new sets of dies, which will take some time to make. In the case of the 3000 locomotives, mechanical stokers are to be provided for at least a part of them, and the plant in which these stokers are to be manufactured has not been built yet.

Cincinnati

CINCINNATI, April 16—(*By Wire*).

Pig Iron.—The shortage of cars is now causing more annoyance in the South than anything else. For several weeks several Southern furnaces were compelled to pile iron because it could not be moved to Northern points on account of freight embargoes and also because of weather conditions. Both of these troubles have been relieved, all freight embargoes are now lifted, but the movement of iron from the South is not as satisfactory as was expected. The trouble now is the scarcity of cars on which to load the metal and this difficulty appears to be more serious than is generally realized. There is a general reluctance on the part of Southern iron producers to sell iron for last half shipment. Only a little off-grade foundry iron is yet to be obtained for second quarter movement, and the furnaces are not able to sell any No. 2 foundry stored because it is all due on old contracts. The situation in the Ironton district is unchanged with the exception that there is a more urgent call for both basic and malleable and the furnace operators are doing their utmost to avoid any shutting down for repairs. The Ohio silvery irons are unobtainable, and melters not covered are now depending on the South for high silicon iron. No sales of consequence have been made in this territory within the past week.

Finished Material.—The tight barrel coopers are now busy making oil barrels, and as a consequence there is a good demand for hoops. The call for whisky barrels, of course, has ceased and for a time the demand for hoops from coopers was very dull. The open weather has helped building operations to some extent, but structural shapes are not wanted, except in a few cases where additions are planned for plants making war supplies. However, most of these additions are of reinforced concrete. Jobbers' stocks of wire nails have run very low, but mill shipments are now moving at a better rate, and the situation will be relieved at an early date. The jobbers' quotations on wire nails is $4 per keg base. Barb wire and wire fencing of all kinds are very hard to get. Nearly all embargoes on shipments to different points have now been raised, so that outbound shipments show considerable improvement.

Based on freight rates of $2.90 from Birmingham and $1.26 Ironton, we quote f.o.b. Cincinnati, as follows:

Southern coke, No. 2 foundry and No. 2 soft	$35.90
Southern Ohio, No. 2	34.26
Basic, Northern	33.26

Coke.—Shipments are moving in a much more satisfactory manner and as a consequence complaints from foundries and consumers are becoming scarcer. However, there is still some complaint in both the Wise County and Pocahontas fields, where cars are very scarce. The Connellsville supply has improved considerably and the labor situation there is also in better condition. Some domestic coke is sold from time to time, but new contracts for foundry coke are scarce. No new furnace business has come to light lately. No inquiries are out for either furnace or foundry coke.

Jobbers' prices are as follows: Iron and steel bars, 4.08½c.; twisted bars, 4.36½c. base; structural shapes, 4.18½c.; plates, ¼-in. and heavier, 4.43½c.; No. 10 blue annealed sheets, 5.43½c.; cold rolled shafting, 10 per cent plus list. The mill price on No. 28 black sheets remains at 5.18½c. and on No. 28 galvanized, 6.43½c. The warehouse price on wire nails is unchanged at $4 per keg base.

Old Material.—The market has a little better tone, but the prices are unchanged. New transactions are not very plentiful, but there is a great deal of improvement in shipments of scrap to the Pittsburgh and Cleveland districts. Offerings from the railroads are light. The local foundries as a rule are buying scrap to fill only their nearby requirements.

The following are dealers' prices f.o.b. at yards, southern Ohio and Cincinnati:

Per Gross Ton	
Bundled sheet scrap	$19.00
Old iron rails	$32.00 to 32.50
Relaying rails, 50 lb. and up	44.00 to 44.50
Rerolling steel rails	31.50 to 32.00
Heavy melting steel scrap	26.00 to 26.50
Steel rails for melting	26.00 to 26.50
Old carwheels	28.00
Per Net Ton	
No. 1 railroad wrought	$28.50 to $29.00
Cast borings	13.00 to 13.50
Steel turnings	13.00 to 13.50
Railroad cast	25.00 to 25.50
No. 1 machinery	25.00 to 25.50
Burnt scrap	16.50 to 17.00
Iron axles	40.00 to 40.50
Locomotive tires (smooth inside)	33.50 to 34.00
Pipes and flues	20.00 to 20.50
Malleable cast	24.00 to 24.50
Railroad tank and sheet	17.00 to 17.50

Birmingham

BIRMINGHAM, ALA., April 15.

Pig Iron.—The lull in other lines of business incident to the opening of the third Liberty loan drive was felt by the iron trade. The labor situation is serious. Several furnaces have banked fires over short periods on account of failure to receive raw material owing to labor shortage and inability to get a full week's work out of the labor that is employed. Two idle stacks expecting to go in before this are still idle on this account. Alabama iron production is 80,000 tons less for the first quarter of 1918 compared with 1917. The ratio of decrease remains about the same in spite of fine weather conditions. Car service has considerably improved, the complaining companies agreeing that movements northward are much more free. Until quite recently, furnace companies were fortunate when able to move the current make; now there is chance of releasing some of the more than 200,000 tons on yards, of which over 100,000 tons is free foundry. Some steel works, which secure their metal from other concerns, report a short supply owing to the demands of the steel-converting plants of the steel manufacturers. Government orders compel the use of this steel for Government purposes. It is understood that T. Takihara, agent for Japanese iron consumers, will return to Alabama to complete arrangements for securing iron to be manufactured at the Talladega furnace. Last half iron is not freely disposed of, but there appear indication of an approaching willingness to book more freely. Several concerns still confine themselves to sales of a few special brands. The percentage of high silicon iron is large. We quote per gross ton f.o.b. Birmingham as follows:

No. 2 foundry and soft	$33.00
Basic	32.00

Old Material.—The scrap market is classed as normal. The supply is adequate to the needs and there is little or no price fluctuations. If scrap continues to enter yards at present pace there will probably be some reductions for a period. We quote per gross ton f.o.b. Birmingham as follows:

Old steel axles	$32.00 to $33.00
Old steel rails	27.50 to 28.00
Heavy melting steel	26.00 to 27.00
No. 1 railroad wrought	31.00 to 32.00
No. 1 cast	28.50 to 29.50
Old carwheels	25.00 to 30.00
Tramcar wheels	21.00 to 25.00
Machine shop turnings	15.00 to 16.00
Cast iron borings	15.00 to 16.00
Stove plate	23.50 to 24.50

Coal and Coke.—Final reports on Alabama coal mined in 1917 show a total of 20,412,841 tons, an increase over 1916 of 2,178,216 tons. Present mine operations are more satisfactory than in some time past and the pace of 1917 is well maintained. Car service has improved. Wagon miners have been classed as retailers. The principal trouble in the coke field is labor. Government works in Alabama offer as high as $3.50 for common day work and labor agents constantly deplete coke oven forces. Otherwise the coke situation is

satisfactory, the entire make being well taken care of. Much attention is given to 72-hr. hand-picked foundry coke owing to the advance from $8 to $8.75.

Cast Iron Pipe.—Fifty per cent operation is about the maximum in the iron pipe field. The leading interest has booked orders for the Government powder works near Nashville and some of the cantonments, but very little has come from municipalities. Sanitary pipe is about the same as water pipe.

Buffalo

BUFFALO, April 15.

Pig Iron.—Although pig iron users know that furnaces have practically all the iron that they can produce for a long period ahead covered by contract, inquiry keeps up persistently, some of it being for considerable tonnages, but chiefly for carload and small lots required by consumers who have been given supplemental Government orders and must have small additional lots of iron in consequence and are scouring the market for it, though with scant success in this district. Some improvement is noted in the matter of increasing the tonnage going out from furnaces daily on existing contracts, on which in many instances shipments are a long way behind schedules. The car supply is still far from adequate, however, for a full speeding up of output shipments. Car shortage is also continuing to hamper deliveries of coke and holding back full production of iron at some furnaces. We quote the Government price schedule as follows, f.o.b. furnace, Buffalo:

No. 1 foundry, 2.75 to 3.25 silicon	$34.50
No. 2 X, 2.25 to 2.75 silicon	33.50
No. 3 foundry, 1.75 to 2.25 silicon	32.50
Gray forge	32.00
Malleable	33.50
Basic	32.00
Lake Superior charcoal, regular grades, f.o.b. Buffalo	37.50

Finished Iron and Steel.—Output in all lines is being diverted more and more into channels where it is required for Government work, and the continued improvement in the railroad situation is resulting in prompter deliveries being made. Good inquiry is noted for turn-buckles for use in airplane hangars and in munition plants for the Government and large demand is also noted in bolts and nuts. Spring requirements are being taken on by jobbers and users. The week has shown a notable improvement in business in structural lines, and a number of industrial structures are being figured on. The Buffalo Structural Steel Co. has just been awarded the contract for structural steel amounting to 1000 tons, for two extensive additions to be made to the foundry plant of the Pratt & Letchworth Co., Buffalo, for which the Hunkin-Conkey Construction Co., Cleveland, holds the general contract. Bids are soon to be taken by Architect G. Morton Wolfe, Main and Utica streets, Buffalo, for erection of a theatre at Erie, Pa., requiring 200 tons of structural steel.

Old Material.—The market continues strong with large but only partially satisfied demand for heavy melting steel, low phosphorus scrap, cast scrap and stove plate. Many foundries are obliged to use cast scrap to a considerably larger extent than usual because of inability to obtain adequate supplies of pig iron. Considerable comment has been excited among dealers and among consumers of low phosphorus scrap by the proposition discussed and acted on by the subcommittee on iron and steel scrap of the American Iron and Steel Institute of placing shell turnings under the classification and price of low phosphorus scrap. It appears to be the consensus of opinion that users of low-phosphorus scrap would not be in any way benefited by the adoption of the classification proposed, and it is understood that the committee has ruled against its adoption. Such ruling is generally commended, and it of course prevents the price of low-phosphorus scrap, $36.50 per ton, being applied to shell turnings, which will in consequence command no higher price than machine shop turnings, i. e., $19 per ton. Investigation appears to determine the fact that consumers of low phosphorus do not want to substitute shell turnings, because they are too light, being in fact suitable for electric furnace uses only, and are not a practicable and profitable substitute for heavy low-phosphorus turnings, and there is no reason for boosting the price of shell turnings to the price of low phosphorus.

There is no change in prices, which are as follows per gross ton, f.o.b. Buffalo:

Heavy melting steel	$29.00
No. 1 low phosphorus, heavy, 0.04 and under	39.00
Low phosphorus, 0.04 and under	36.50
Low phosphorus, not guaranteed	34.00
No. 1 railroad wrought	34.00
No. 1 railroad and machinery cast	34.00
Iron axles	$44.00 to 46.00
Steel axles	44.00 to 46.00
Carwheels	29.00
Railroad malleable	34.00
Machine shop turnings	17.00 to 17.50
Heavy axle turnings	24.00
Clean cast borings	18.00 to 19.00
Iron rails	24.00
Locomotive grate bars	24.00
Stove plate	24.00
Wrought pipe	27.00 to 28.00
No. 1 busheling scrap	29.00 to 30.00
No. 2 busheling scrap	21.00 to 23.00
Bundled sheet stamping scrap	21.00 to 23.00

St. Louis

ST. LOUIS, April 15.

Pig Iron.—Deliveries on contracts for pig iron continue to improve, but are not yet entirely satisfactory to the melters. New business could be had in large quantities, but none of the furnace representatives is offering anything except off runs and surpluses in small lots, which are taken off their hands immediately by customers, who are becoming less and less particular as to analyses, preferring to devise mixtures which will enable them to turn out their work under contract. Of such small lot sales, the aggregate has run into a total of several thousand tons during the week. Included in the transactions of the week also were sales of two carloads of domestic ferromanganese somewhat lower than the usual percentage, which went for $250 to $285 per ton. Most furnace representatives are awaiting the time when their principals will have cleared up the business already on hand before trying to enter into new transactions and some indications are that this will not be soon.

Coke.—The deliveries of coke are much better than they have been and representatives of ovens are receiving notifications from their principals that they will be able to take care of their old customers for the new coke year, which, however, does not begin until the end of June. No new business is being sought either for the nearby or future delivery, although some small orders for prompt shipment have been put through during the week.

Finished Iron and Steel.—Finished products still follow the long prevailing course of delivery at mill convenience, with little effort to establish new business. Mill representatives are trying to take care of old customers as best they can and continue to place wants of customers on file to fill as opportunity offers, but no new contracts are being made for any class of material. Movement out of warehouse continues heavy and a very large proportion of transactions continues on the future basis, the warehouses having in many instances to wait for the arrival of material from the mills. For stock out of warehouse we quote as follows: Soft steel, bars, 4.17c.; iron bars, 4.17c.; structural material, 4.27c.; tank plates, 4.52c.; No. 8 sheets, 5.47c.; No. 10 blue annealed sheets, 5.52c.; No. 28 black sheets, cold rolled, one pass, 6.52c.; No. 28 galvanized sheets, black sheet gage, 7.77c.

Old Material.—In the scrap market, uncertainty prevails, with a weakening tone to the quotations. Neither consumers nor dealers are willing to enter into transactions and in consequence no business of moment is being done, though the consuming industries are getting lower and lower in their supplies and on their contract deliveries to come. The dealers are still unable to get settled down upon a commission basis nor are they able to arrive at a satisfactory basis of doing business on

the Government price arrangement, with the result that the market is erratic and transactions, such as they are, go through on the basis of immediate needs of the parties thereto. The lists out include 1000 tons from the Chicago and Alton, 10,000 tons from the Baltimore and Ohio, 300 tons from the Great Northern, 1500 tons from the Monon, 2000 tons from the Wabash and 1000 tons from the Missouri, Kansas and Texas.

	Per Gross Ton	
Old iron rails	$35.00 to	$35.50
Old steel rails, re-rolling	33.50 to	34.00
Old steel rails, less than 3 ft	32.50 to	33.00
Relaying rails, standard sections, subject to inspection	60.00 to	65.00
Old carwheels	28.50 to	29.00
No. 1 railroad heavy melting steel scrap	28.50 to	29.00
Heavy shoveling steel	27.50 to	28.00
Ordinary shoveling steel	26.50 to	27.00
Frogs, switches and guards cut apart	28.50 to	29.00
Ordinary bundled sheet scrap	22.00 to	22.50
Heavy axle and tire turnings	19.00 to	20.00
Per Net Ton		
Iron angle bars	$33.00 to	$33.50
Steel angle bars	28.00 to	28.50
Iron car axles	40.00 to	40.50
Steel car axles	40.00 to	40.50
Wrought arch bars and transoms	39.00 to	40.00
No. 1 railroad wrought	28.50 to	29.00
No. 2 railroad wrought	28.00 to	28.50
Railroad springs	28.50 to	29.00
Steel couplers and knuckles	29.00 to	29.50
Locomotive tires, 42 in. and over, smooth inside	35.00 to	35.50
No. 1 dealers' forge	26.00 to	26.50
Cast iron borings	15.50 to	16.00
No. 1 busheling	24.50 to	25.00
No. 1 boilers, cut to sheets and rings	22.00 to	22.50
No. 1 railroad cast scrap	25.00 to	25.50
Stove plate and light cast scrap	20.00 to	20.50
Railroad malleable	25.50 to	26.00
Agricultural malleable	24.00 to	24.50
Pipes and flues	23.00 to	23.50
Heavy railroad sheet and tank scrap	21.50 to	22.00
Railroad grate bars	19.50 to	20.00
Machine shop turnings	15.50 to	16.00
Country mixed scrap	19.00 to	19.50
Uncut railroad mixed scrap	22.00 to	22.50

Cleveland

CLEVELAND, April 16 (*By Wire*).

Iron Ore.—There has been a heavy demand for manganiferous ores from the Lake Superior district during the past week, and sales have been made aggregating 155,000 tons. About all the manganiferous ore that will be available this year has now been disposed of. Information as to the iron ore requirements for the next 12 months that was requested from the blast-furnace men at the meeting of the representatives of ore firms, consumers and shipping interests held recently in Cleveland, is now coming in, and reports from all the consumers are expected within the next week. Plans for handling the ore to meet the needs of the consumers will be worked out as soon as the total requirements are known. The requirements will probably not be as heavy as last year, owing to the fact that many consumers will have more ore on hand May 1 than they expected because of curtailment of blast furnace operations during the past winter. Shipments from Lake Erie docks are now very heavy, and these will be in fairly good shape to receive ore when navigation opens. No date has been set for the opening of navigation, but it will probably be about April 25. We quote f.o.b. lower Lake ports:

Old range Bessemer, $5.95; old range non-Bessemer, $5.20; Mesaba Bessemer, $5.70; Mesaba non-Bessemer, $5.05.

Pig Iron.—Inquiry is heavy for all grades of pig iron, but the only iron to be had in this territory is from one producer that is still supplying its regular trade in foundry grades only. Several Ohio steel makers are still in the market for round lots of basic iron, having been unable to cover on their recent inquiries. The General Electric Co. is inquiring for a round tonnage for its various plants, including 6800 tons of malleable, foundry and Bessemer iron for its Erie works for June-December delivery. The 1000 tons of low phosphorus iron for the Watertown Arsenal and 700 tons of foundry iron for a Kalamazoo, Mich., fuse manufacturer, for which inquiries were noted last week, have been allotted. No new Government inquiries of any size have come out. One southern Ohio producer a few days ago opened its books for the sale of silvery iron for the last half and sold all it had to offer, about 6000 tons, allotting its trade only about one-half of requirements.

Bessemer	$36.25
Basic	32.30
Northern No. 2 foundry	33.30
Southern No. 2 foundry	37.00
Gray forge	32.30
Ohio silvery, 8 per cent silicon	46.12
Standard low phosphorus, Valley furnace	53.00

Ferroalloys.—The demand for ferromanganese and spiegeleisen continues active, and several sales of each up to 1000-ton lots are reported for the last half at $282, delivered, for 78 per cent ferromanganese, and $80 for 19 to 21 per cent spiegeleisen. There is a great deal of inquiry for both for delivery before July 1, but practically none to be had for that delivery.

Coke.—A plan to prevent cross hauling of coke that was proposed at the coke conference in Washington last week provides that the McKinney Steel Co. supply the Upson Nut Co. in Cleveland and that the Connellsville coke that has been furnished the latter company by the Taylor Coal & Coke Co., an allied interest, be shipped to Josephine furnaces. Should this plan be adopted by the Fuel Administrator it will upset the former plan for the McKinney by-product plant to supply the Cleveland foundries.

Finished Iron and Steel.—The Government orders for steel have become so heavy that domestic consumers have little prospect of securing material. The Carnegie Steel Co. is notifying its trade that orders on its books for other than Government and railroad work cannot be scheduled for rolling. Consumers doing both Government and commercial work are requested to advise as to the percentage of Government work they did during the first quarter, and efforts will be made to supply them with a corresponding portion of their tonnage. The Jones & Laughlin Steel Co. has notified its trade that it will devote its entire capacity for 30 days or longer to Government orders, and that it can make no delivery promises on commercial business. Consumers are finding it increasingly difficult to secure steel from the mills unless they have priority orders. Government requirements are now taking practically all the plate tonnage, and local mills are taking orders only for Government work. The Cleveland office of the Shipping Board is buying considerable steel in channels, angles, plates and bars for use in Lake shipyards in fitting up boats for ocean service. Some of this steel is being obtained from warehouses. Government inquiries have come out for about 3000 tons of steel for bridge work and dry docks. Among other inquiries is one for 2700 tons of bars and bands, and 1500 tons of blooms. There is a great deal of inquiry for sheet bars for the second quarter. Many mills have been able to secure only a portion of their supply, and the shortage is causing much anxiety among consumers. Bar iron is in light demand, although some Government orders are being placed for wagon tires. The sheet mills are practically all filled up with Government orders, and commercial users are finding it more difficult to place tonnage. Among new Government orders is one for 900 tons placed with a Cleveland mill.

We quote warehouse prices as follows: Steel bars, 4.03½c.; plates, 4.38½c.; structural material, 4.13½c.; No. 10 blue annealed sheets, 5.35c.; No. 28 black sheets, 6.35c.; No. 28 galvanized sheets, 7.60c.

Rivets.—Specifications on contracts from shipbuilding companies are very heavy, but new business is light as consumers are practically all under contract.

Bolts and Nuts.—The demand for bolts and nuts is only moderate. It is expected that an announcement regarding prices will be made in Washington this week, and manufacturers look for a reaffirmation of present prices. Some buyers are withholding placing orders until the price question is definitely disposed of. The Government inquiry for 129,000,000 bolts and nuts for use in France is still pending, but this business is expected to be placed in a few days.

Old Material.—There is little activity in the market.

Transactions are confined largely to miscellaneous scrap which dealers are able to handle at a profit. Dealers for the most part are confining their activities to filling old orders, and are making no efforts to sell grades of scrap regulated by the Government, and which they cannot buy below Government prices. The volume of business is probably not above 30 per cent of normal. Producers are not endeavoring to move material, evidently waiting until a ruling is made on the matter of commissions. Dealers still have a great deal of scrap to ship on old contracts, and consumers are getting as much material as needed. The railroad situation has improved materially, so that dealers are supplying the mills with a fair volume of scrap. Bushleling scrap is weak, and sales are reported to dealers at $26.75 net. Cast scrap, stove plate and grate bars are also slightly easier.

New York

NEW YORK, April 17.

Pig Iron.—Selling policies of Virginia furnaces are becoming more definitely known. These furnaces are extremely conservative about taking on any contracts for delivery through the second half of the year owing to the many uncertainties concerning prices and production, but some sellers are giving customers assurances that they will be protected during the second half to the extent of the tonnage purchased during the first half. One important Virginia company contemplates manufacturing a considerable tonnage of low phosphorus pig iron and for this reason, and also because it is already behind in its deliveries, will not have much foundry iron to sell for the remainder of this year. A rather surprising tonnage of Alabama iron is being sold in the East in view of the very high freight rate of $6.15 which must be paid on all-rail shipments. No shipments are being made by water. Much of this buying is for foundries which are afraid they will not be able to obtain enough Northern iron to meet their requirements. Reports in regard to transportation indicate a decided improvement in the Buffalo district, a fair movement in the South and only a very moderate change for the better in Eastern Pennsylvania. We quote as follows for tidewater deliveries:

No. 1 X	$35.25
No. 2 X	34.25
No. 2 plain	33.75
No. 1 Southern	$39.75 to 40.25
No. 2 Southern (rail and water)	39.00 to 39.25
No. 2 Southern (all rail)	39.15 to 39.65
No. 2 X Virginia	37.02

Ferroalloys.—There is decided activity in spiegeleisen, much more than in ferromanganese. Besides the large inquiries noted last week, others have appeared aggregating several thousand tons. One consumer desires 500 to 1000 tons of 20 to 25 per cent alloy with a minimum of 1.50 per cent silicon, for prompt delivery; another will buy 1000 to 1500 tons of 20 per cent alloy for second and third quarter delivery, and a third is inquiring for 600 tons of 16 per cent material for the same delivery. The quotation seems to be $70, furnace, for 16 per cent alloy, with $3.50 additional for each unit above this, but no sales are cited to establish this. For domestic ferromanganese inquiries have been less in the last week. A few sales of small lots are reported on the basis of the new standard or at $250 for 70 per cent alloy. It appears that the new method of arriving at values is to necessitate careful analysis of each consignment by both sellers and buyers, so that alloy analyzing 72 or 72.70 per cent may be sold at $4 per unit above the 70 per cent level. Some trouble as well as confusion and possible dissatisfaction is expected to result. For 30 to 35 per cent alloy $3.65 per unit is now asked against $3.50 previously. A decided shortage of manganese ore of proper grade and analysis is looked for by producers before many weeks. It is believed that the domestic producers will not be able to deliver the amount of ore which they have said they could, and on whose calculations and promises the plans of the Government are largely based. Some ferromanganese producers have in several cases been unable to obtain deliveries of ore in the past as contracted for by certain mining companies. Imports of ferromanganese are larger than in the first two months of the year. Those for March will exceed 3000 tons, and April receipts are maintaining a good average. Ferrosilicon, 50 per cent, is strong and active at $155 to $165 per ton for forward delivery and up to $190 for prompt and early delivery, depending on the quantity and time of shipment. Some other ferroalloys in which there are few market changes from week to week are quoted in this paragraph in the first week of each month.

Finished Iron and Steel.—Not only is it difficult to get open-hearth steel from regular sources of supply for work that is not for Government contracts, but mills are tightening up on the delivery of Bessemer steel. This is partly due to the fact that rolling mills are too well occupied to admit of putting through the Bessemer product. The condition points to the need of manufacturing consumers scouting for suitable material from stocks of other consumers, as well as those regularly in the warehouse business. Bids are shortly to be taken for more warehouses for the construction corps of the Quartermaster Department, one in Brooklyn and one perhaps at Norfolk, Va. The structures are likely to be built of reinforced concrete, but a large tonnage of reinforcing steel will be required. A new war demand comes for angle stakes for wire entanglements, involving perhaps 7500 tons of 1¾-in. equal leg angles, roughly 3 and 8 ft. in length, besides ⅝-in. rounds to be made into screw stakes for similar purposes. All told, 1,100,000 of the angle stakes are under consideration. Some large fabricated steel contracts have been closed, following a March which shows a total for the first time in seven or eight years below the totals for either January or February of the same year. As March contracts commonly exhibit the impetus of building work, the figure this year is indicative of the dullness of general building construction. For the Crucible Steel Co. about one-third of the work at Harrison, N. J., and two-thirds at Syracuse, the American Bridge Co. will supply 9500 tons of steel work. The Bethlehem Steel Bridge Corporation is low bidder on 3600 tons for the Culver line extension in Brooklyn. The Guerber Engineering Co. will erect a 2000-ton structure for the Lackawanna Coal Breaker Co. at Dickson City, Pa. The Pennsylvania is in the market for 350 tons of bridge work and the New York Central for a like amount. The power house at Langley Field is up again for the third time, now involving not more than 200 tons. The Government railroad car order still hangs fire, with little authentic information as to the reason, but it may be said that in the face of the fact that car builders are practically without car orders, deliveries were contracts placed at this time would not begin before August, and it would be doubtful if all of the 100,000 under consideration would be delivered before Jan. 1. Meanwhile, the West Milwaukee locomotive and car shops of the St. Paul system have been at work two or three weeks on 5000 freight cars under authority of the Director General of Railroads.

Cast Iron Pipe.—Rumors that the city of Waterford, Conn., will be in the market for the long-talked-of waterworks construction, requiring some 30,000 tons of 42-in. pipe, have been revived, but bids have not been called for and probably will not be at an early date, as there is much uncertainty concerning the proposition. No other important public business is in sight. Manufacturers are devoting a considerable part of their capacity to special fittings.

Old Material.—Railroads are offering very little scrap for sale nowadays, and this is attributed largely to the scarcity of common labor and the high wages which must be paid for it. Considerable mystery has surrounded the handling of 50,000 tons of heavy melting steel purchased for export by the Italian Government. The report that this scrap had been sold is now denied, but it is understood that it will be disposed of unless ships can soon be obtained to transport it to Italy. Uncertainty as to commissions is still a disturbing factor in the market and dealers report that they find it almost impossible to make any profit except on old contracts.

Prices Finished Iron and Steel, f.o.b. Pittsburgh

Freight rates from Pittsburgh on iron and steel articles, aside from wrought iron and steel pipe in carloads, per 100 lb., New York, 19.5c.; Philadelphia, 18.5c.; Boston, 21.5c.; Buffalo, 11.6c.; Cleveland, 13.5c.; Cincinnati, 18.5c.; Indianapolis, 20c.; Chicago, 21.5c.; St. Louis, 27c.; Kansas City, 47c.; minimum carload, 36,000 lb.; St. Paul, 40c.; minimum carload, 36,000 lb.; Denver, 79c.; minimum carload, 36,000 lb.; Omaha, 47c.; minimum carload, 36,000 lb.; New Orleans, 30.7c.; Birmingham, 46c.; Pacific Coast, $1.00; minimum carload, 80,000 lb. To the Pacific Coast the rate on steel bars and structural steel is $1.05, minimum carload, 40,000 lb.; and $1.00, minimum carload, 50,000 lb. On wrought iron and steel pipe the rate from Pittsburgh to Kansas City is 40c. per 100 lb., minimum carload 46,000 lb.; to Omaha, 40c., minimum carload 46,000 lb.; to St. Paul, 35.5c., minimum carload 46,000 lb.; Denver, 79c.. minimum carload 46,000 lb. A 3 per cent transportation tax now applies. On iron and steel items not noted above, rates vary somewhat, and are given in detail in the regular railroad tariffs.

Structural Material

I-beams, 3 to 15 in.; channels, 3 to 15 in. angles, 3 to 6 in. on one or both legs, ¼ in. thick and over, and zees, structural sizes, 3c.

Wire Products

Wire nails, $3.50 base per keg; galvanized, 1 in. and longer, including large-head barb roofing nails taking an advance over this price of $2, and shorter than 1 in., $2.50. Bright basic wire, $3.35 per 100 lb.; annealed fence wire, Nos. 6 to 9, $3.25; galvanized wire, $3.95; galvanized barb wire and fence staples, $4.35; painted barb wire, $3.65; polished fence staples, $3.65; cement-coated nails, $3.40 base; these prices being subject to the usual advances for the smaller trade, all f.o.b. Pittsburgh, freight added to point of delivery, terms 60 days net, less 2 per cent off for cash in 10 days. Discounts on woven-wire fencing are 47 per cent off list for carload lots, 46 per cent for 1000-rod lots, and 45 per cent off for small lots, f.o.b. Pittsburgh.

Bolts, Nuts and Rivets

Large rivets ..... $4.65 base
7/16 in. x 6 in. smaller and shorter rivets. 45-10 per cent off list
Machine bolts h.p. nuts, ⅝ in. x 4 in.:
Smaller and shorter, rolled threads.... 50-10-5 per cent off list
Cut threads ..... 50-5 per cent off list
Larger and longer sizes ..... 40-10 per cent off list
Machine bolts c.p.c. and t. nuts, ⅝ in. x 4 in.:
Smaller and shorter ..... 40-10 per cent off list
Larger and longer ..... 35-5 per cent off list
Carriage bolts, ⅜ in. x 5 in.:
Smaller and shorter, rolled threads ..... 50-5 per cent off list
Cut threads ..... 40-10 per cent off list
Larger and longer sizes ..... 40 per cent off list
Lag bolts ..... 50-10 per cent off list
Plow bolts, Nos. 1, 2, 3 ..... 50 per cent off list
Hot pressed nuts, sq., blank ..... 2.50c. per lb. off list
Hot pressed nuts, hex., blank ..... 2.30c. per lb. off list
Hot pressed nuts, sq., tapped ..... 2.30c. per lb. off list
Hot pressed nuts, hex., tapped ..... 2.10c. per lb. off list
C.p.c. and t. sq. and hex. nuts, blank ..... 2.25c. per lb. off list
C.p.c. and t. sq. and hex. nuts, tapped ..... 2.00c. per lb. off list
Semi-finished hex. nuts:
⅝ in. and larger ..... 60-10-10 per cent off list
9/16 in. and smaller ..... 70-5 per cent off list
Stove bolts ..... 70-10 per cent off list
Stove bolts ..... 2½ per cent extra for bulk
Tire bolts ..... 50-10-5 per cent off list

The above discounts are from present lists now in effect. All prices carry standard extras.

Wire Rods

No. 5 common basic or Bessemer rods to domestic consumers, $57; chain rods, $65; screw, rivet and bolt rods and other rods of that character, $65. Prices on high carbon rods are irregular. They range from $70 to $80, depending on carbons.

Railroad Spikes and Track Bolts

Railroad spikes, 9/16 in. x 4½ in. and heavier, per 100 lb., $3.90, in lots of 200 kegs of 200 lb. each, or more; track bolts, $4.90. Boat spikes, $5.25 per 100 lb., f.o.b. Pittsburgh.

Terne Plate

Effective Nov. 7 prices on all sizes of terne plates are as follows: 8-lb. coating, 200 lb., $15 per package; 8-lb. coating, I. C., $15.30; 12-lb. coating, I. C., $16.75; 15-lb. coating, I. C., $17.75; 20-lb. coating, I. C., $19; 25-lb. coating, I. C., $20; 30-lb. coating, I. C., $21; 35-lb. coating, I. C., $22; 40-lb. coating, I. C., $23 per package, all f.o.b. Pittsburgh, freight added to point of delivery.

Iron and Steel Bars

Steel bars at 2.90c. from mill, and 4.50c. to 5c. from warehouse in small lots for prompt shipment. Refined iron bars, 3.50c. in carload and larger lots, f.o.b. mill.

Wrought Pipe

The following discounts are to jobbers for carload lots on the Pittsburgh basing card, as announced Nov. 5 by the Government on steel pipe, those on iron pipe being the same as quoted for some time:

Butt Weld

Steel			Iron		
Inches	Black	Galv.	Inches	Black	Galv.
⅛, ¼ and ⅜	44	17½	⅛ and ¼	23	+4
½	48	33½	⅜	24	+3
¾ to 3	51	37½	½	28	10
			¾ to 1½	33	17

Lap Weld

2	44	31½	1¼	18	3
2½ to 6	47	34½	1½	25	11
7 to 12	44	30½	2	26	12
13 and 14	34½	..	2½ to 6	28	15
15	32	..	7 to 12	25	12

Butt Weld, extra strong, plain ends

⅛, ¼ and ⅜	40	22½	⅛, ¼ and ⅜	22	5
½	45	32½	½	27	14
¾ to 1½	49	36½	¾ to 1½	33	18
2 to 3	50	37½			

Lap Weld, extra strong, plain ends

2	42	30½	1¼	19	4
2½ to 4	45	33½	1½	25	11
4½ to 6	44	32½	2	27	14
7 to 8	40	26½	2½ to 4	29	17
9 to 12	35	21½	4½ to 6	28	16
			7 to 8	20	8
			9 to 12	15	3

To the large jobbing trade an additional 5 per cent is allowed over the above discounts, which are subject to the usual variations in weight of 5 per cent. Prices for less than carloads are four (4) points lower basing (higher price) than the above discounts on black and 5½ points on galvanized.

On butt and lap weld sizes of black iron pipe, discounts for less than carload lots to jobbers are seven (7) points lower (higher price) than carload lots, and on butt and lap weld galvanized iron pipe are nine (9) points lower (higher price).

Boiler Tubes

The following are the prices for carload lots, f.o.b. Pittsburgh, announced Nov. 13, as agreed upon by manufacturers and the Government:

Lap Welded Steel		*Charcoal Iron*	
3½ to 4½ in.	34	3½ to 4½ in.	12½
2½ to 3¼ in.	24	3 to 3¼ in.	+ 5
2¼ in.	17½	2½ to 2¾ in.	+ 7½
1¾ to 2 in.	13	2 to 2¼ in.	+22½
		1¾ to 1⅞ in.	+35

Standard Commercial Seamless—Cold Drawn or Hot Rolled

	Per Net Ton		Per Net Ton
1 in.	$340	1¾ in.	$220
1¼ in.	280	2 to 2½ in.	190
1⅜ in.	270	2¾ to 3¾ in.	180
1½ in.	220	4 in.	200
		4½ to 5 in.	220

These prices do not apply to special specifications for locomotive tubes nor to special specifications for tubes for the Navy Department, which will be subject to special negotiation.

Sheets

Makers' price for mill shipments on sheets of United States standard gage in carload and larger lots, are as follows, 30 days net or 2 per cent discount in 10 days:

Blue Annealed—Bessemer	Cents per lb.
No. 8 and heavier	4.20
Nos. 9 and 10	4.25
Nos. 11 and 12	4.30
Nos. 13 and 14	4.35
Nos. 15 and 16	4.45
Box Annealed, One Pass Cold Rolled—Bessemer	
Nos. 17 to 21	4.80
Nos. 22 and 24	4.85
Nos. 25 and 26	4.90
No. 27	4.95
No. 28	5.00
No. 29	5.10
No. 30	5.20
Galvanized Black Sheet Gage—Bessemer	
Nos. 10 and 11	5.25
Nos. 12 and 14	5.35
Nos. 15 and 16	5.50
Nos. 17 to 21	5.65
Nos. 22 and 24	5.80
Nos. 25 and 26	5.95
No. 27	6.10
No. 28	6.25
No. 29	6.50
No. 30	6.75
Tin-Mill Black Plate—Bessemer	
Nos. 15 and 16	4.80
Nos. 17 to 21	4.85
Nos. 22 to 24	4.90
Nos. 25 and 27	4.95
No. 28	5.00
No. 29	5.05
No. 30	5.05
Nos. 30½ and 31	5.10

Metal Markets

The Week's Prices

Cents Per Pound for Early Delivery

	Copper, New York		Tin,	Lead		Spelter	
Apr.	Lake	Electro-lytic	New York	New York	St. Louis	New York	St. Louis
9	23.50	23.50	*87.00	7.00	6.90	7.00	6.75
10	23.50	23.50	*87.00	7.00	6.90	7.00	6.75
11	23.50	23.50	*87.00	6.95	6.80	7.00	6.75
12	23.50	23.50	*87.00	6.95	6.80	7.00	6.75
13	23.50	23.50	*87.00	6.95	6.80	7.00	6.75
15	23.50	23.50	*87.00	6.95	6.80	7.00	6.75
16	23.50	23.50	*87.00	6.95	6.80	7.00	6.75

*Nominal.

NEW YORK, April 16.

Inactivity still pervades all the markets. The copper market is without feature or change of any kind. Tin is less active than in some time, pending what are believed to be important developments. Lead is in poor demand and a little lower. Spelter is unchanged and dull. Antimony is unchanged.

New York

Copper.—Further reports of March output indicate a decided expansion, substantiating predictions of at least 200,000,000 lb. per month or more in April or later. Because of mounting costs some small producers have organized a committee to present their grievances at Washington. An authority makes the statement that the Government is so slow in making settlements that many copper interests are financially embarrassed and that copper producers are said to be creditors of the Government to the extent of about $16,000,000. Verification of this has not been possible except that comment in the trade is that it is entirely possible. The production and distribution of the metal is closely controlled by the Copper Producers Committee at the Government prices of 23.50c. for carloads and 24.67½c. for less.

Tin.—While the scarcity of sellers is as great as ever, buyers are not as eager as they were a week or two ago. The change in their attitude is believed to be due to proceedings in Washington. Reports as to just what is going on there are conflicting. Consumers have been called to Washington this week and meetings are being held each day between Government representatives and various branches of the tin consuming trade. Rumors state that these have to do primarily with the conservation of the tin supply, but it is thought by some that something more radical than this is back of the deliberations. Until this situation is cleared up there will be less eagerness to buy. The entire situation is as unsatisfactory as ever and offerings from the other side are almost nothing. Prices for what has been offered have gone extraordinarily high. For spot tin the quotation now is 87c., New York, which is nominal, and represents what it could probably be obtained for if offered and sold under reasonable conditions. A representative of a South American company is in New York and states that he has 100 to 150 tons of tin on the way from that locality which analyses 99.86 per cent tin, and that he will be able to offer 500 tons per month soon. Arrivals to April 10, inclusive, have been 265 tons, with 5000 estimated afloat. The London market has advanced. Yesterday spot Straits was quoted there at £323 10s. per ton as compared with £319 10s. one week ago.

Spelter.—The market has not declined below the levels of a week ago. Prime Western for early delivery is quoted at 6.75c., St. Louis, or 7c., New York. Demand is fair, but sales are not in large volume. Business has been done for April-May delivery at 6.80c., St. Louis, and also for May-June-July delivery at 6.87½c., St. Louis. The rate of production is believed to be declining rapidly. The official reports for the first quarter are eagerly awaited.

Lead.—The American Smelting & Refining Co. reduced its quotation last week, Thursday, ¼c. per lb. to 7c., New York, and at the same time the outside market dropped to 6.95c., New York, or 6.80c., St. Louis. The market is a narrow and restricted one, with an easy tone. There is a little more lead obtainable than the market will absorb and business has been very light. The position of the large producers is unchanged; they are pretty well sold up and arrivals from the West are much better. The big independent producer referred to last week is still shut down because of labor troubles, and this has removed a considerable supply from the market.

Antimony.—Quotations are unchanged at 12.75c. to 13c., New York, duty paid, for prompt and early delivery. Demand is very light, even the Government purchases now being small.

Aluminum.—No. 1 virgin metal, 98 to 99 per cent pure, is under Government control, and there has been no change since last week in quotations or conditions.

Old Metals.—The market is very dull. Scrap lead is lower, in sympathy with the reduction in price of new lead. Dealers' selling prices are as follows:

	Cents per lb.
Copper, heavy and crucible	23.50
Copper, heavy and wire	23.50
Copper, light and bottoms	21.00 to 21.50
Brass, heavy	16.25 to 16.50
Brass, light	12.00 to 12.25
Heavy machine composition	23.75 to 24.00
No. 1 yellow rod brass turnings	13.00 to 13.50
No. 1 red brass or composition turnings	19.00 to 20.00
Lead, heavy	6.50
Lead, tea	5.50
Zinc	5.75

Chicago

APRIL 16.—Despite recent fears of a scarcity, stocks of copper now appear to be ample to meet the active demand which exists. It is still difficult to obtain tin for prompt delivery although some May and June is being offered. Spelter is in abundant supply and dull, while there is not much doing in lead. Antimony remains quiet.

We quote: Copper in carload lots, 23½c.; in part carloads, 24.67½c.; lead at 6.95c.; spelter at 6.95c.; tin at 90c., and antimony, 15c. On old metals, we quote buying prices for less than carload lots as follows: Copper wire crucible shapes, 21c.; copper clips, 21c.; copper bottoms, 19c.; red brass, 21c.; yellow brass, 15c.; lead pipe, 5½c.; zinc, 5c.; pewter, No. 1, 55c.; tin foil, 55c., and block tin, 70c.

St. Louis

APRIL 15.—Non-ferrous metals have been rather quiet with the Missouri product weaker, though there was some reaction upward at the close of the week. The close to-day, carload lots, was: Lead, 6.90c.; spelter, 6.92½c. Less than carload lots: Lead, 7.25c. to 7.37½c.; spelter, 8.37½c. to 8.50c.; tin, 90c.; copper, 25.12½c.; Asiatic antimony, 18.50c. In the Joplin ore district zinc blende was weaker and the range, basis of 60 per cent metal, was $40 to $55 per ton, with the average for the week for the district at $43 per ton because of the low grade ore sold. The slump was largely due to the heavy production of the week and the needs of the producers. Calamine was steady with small production at $30 to $35 per ton, basis of 40 per cent metal, and the average for the week for the district was $34 per ton. Lead ore was steady at $85 per ton, basis of 80 per cent metal, and the average for the week was held at $85 because of the premium grades sold. On miscellaneous scrap metals we quote dealers' buying prices as follows: Light brass, 10c.; heavy yellow brass, 14c.; heavy red brass and light copper, 19.50c.; heavy copper and copper wire, 20c.; pewter, 25c.; tinfoil, 50c.; lead, 5c.; spelter, 5.50c.; tea lead, 5c.

Ex-President Taft Will Speak at Metal Trades Banquet

The next annual convention of the National Metal Trades Association will be held in the Hotel Astor, New York, April 23 and 24. The speaker of the evening at the annual banquet will be former President William H. Taft. The program includes: Industrial Reaction, Judge E. K. Nicholson; National Industrial Conference Board, Robert Greene Duncan; The Employment of Women in an Industry, W. A. Viall; Industrial Training for the War Emergency, H. E. Miles; New Lamps for Old, James A. Emery; Present Socialistic Developments, William H. Barr.

Plans for the Greatest of Gun Plants

Government and Steel Corporation Will Co-operate in Its Construction—A Pittsburgh District Site Likely to Be Chosen

WASHINGTON, April 16.—The Ordnance Bureau of the War Department, within a few days, will decide upon the final details of a project under consideration for several months, involving the construction of a new Government arsenal on a scale greater than the Watertown and Watervliet establishments, and embracing the most modern equipment for every process of gun manufacture. In this mammoth plant will be forged, machined and assembled large-caliber guns ranging up to 16-in. howitzers, and in addition there will be installed a complete plant for the production of shrapnel and shells of the larger sizes. Work on the new plant will be begun at once, and the entire establishment will be rushed to completion at the earliest practicable date.

Steel Corporation to Co-operate

The new arsenal, which is to be built by the Government in co-operation with the United States Steel Corporation, was originally conceived when it became apparent some time ago that the Watervliet and Watertown arsenals, even with the extensive additions then projected, would not suffice for the execution of the constantly expanding ordnance program, even taking into account the dozen or more big private establishments which have been greatly enlarged with Government funds for the production of forgings and the machining and assembling of guns.

There is absolutely no basis for reports current in the daily press that the Ordnance Bureau is now expanding its program because of the temporary success of the big German drive on the western front. The details of the project for enlarging Watervliet and Watertown, and of financing private plants for ordnance work; were published in THE IRON AGE last September, and it is now many weeks since the developments at the two arsenals and the apparent necessity for even greater facilities under the direct control of the Government made it obvious that a third arsenal must be provided. This project, therefore, while new in the sense that its minute details have not yet been worked out, has been in contemplation for a long time, and is by no means an expedient forced upon the Ordnance Bureau by recent untoward incidents in the great campaign in France.

Pittsburgh District May Be Chosen

The location of the new arsenal will probably be determined during the present week. The requirements concerning labor, raw material, transportation, manufacturing experience of the supervising personnel, etc., all combine to suggest that a site will be chosen in the Pittsburgh district. By an arrangement now being worked out, the Steel Corporation will establish open-hearth furnaces either in conjunction with the arsenal plant or in the immediate vicinity, and will supply the necessary ingots. The arsenal equipment, however, will include the heavy forging presses and all paraphernalia for treating and forging the ingots. A fully equipped machine shop, which will probably exceed in size anything in the United States, will also be provided, and several million dollars worth of machine tools will be acquired as speedily as possible.

Great Projectile Factory

An important feature of the arsenal will be the projectile factory, in which will be made large quantities of shells of various calibers, chiefly those from 8 in. to 16 in., 8 in. predominating. It is understood that the forging shop for guns will be so fitted up as to do the necessary forging for the shells, and in making joint provision for these two branches of work the establishment will be an advance upon anything heretofore attempted in this country.

Throughout the negotiations the officials of the Steel Corporation have co-operated with the Government to expedite the new project and to render the new arsenal one of the most efficient manufacturing establishments in the world. All the facilities of the corporation have been placed at the disposal of the Government, and in perfecting the organization to operate the arsenal and to meet any mechanical or metallurgical problems that may arise the corporation's entire personnel will be at the service of the Ordnance Bureau.

Eight-Inch Howitzers Predominate

While the new plant will be equipped to build 16-in. guns, it is believed that the bulk of its output will be howitzers of 8-in. caliber. The Ordnance Bureau has been thoroughly familiar with the development of the German ordnance program, and more than two years ago investigated the practicability of the 42-centimeter howitzers which have formed such a spectacular but not particularly effective feature of the recent Teutonic offensive. Rifles and howitzers of such caliber that they require permanent emplacements for their operation are regarded by American ordnance experts as of very doubtful utility except for permanent fortifications. The impossibility of moving them forward in unison with infantry attacks, and the danger of their capture when retreats are necessary, have served to render these big guns far less serviceable than mobile artillery of smaller size and range. In the big drive of the German army it has been found impossible to support the infantry with adequate artillery, which has accounted for the slowing down of the attacks, leaving the German forces at the mercy of the machine guns and light artillery of the French and British armies, which have taken so heavy a toll that it is problematical that the Kaiser's troops will ever again be able to launch such an offensive. The bulk of field equipment, from either an offensive or defensive standpoint, in the opinion of our ordnance experts, should be of the heaviest caliber consistent with reasonable mobility. The 8-in. howitzer appears to be an ideal weapon with all service conditions in view, and the present program which provides for the manufacture of more guns than are now possessed by the British and French armies combined, will include a very large percentage of these howitzers.

W. L. C.

Locomotive Orders

The Paris, Lyons & Mediterranean has ordered 100 Mikado locomotives from the Baldwin Locomotive Works. The Central Railway of Brazil has ordered from the American Locomotive Co. five consolidation locomotives and one Mallet locomotive.

The Al-Ko Co., New Haven, Conn., has been incorporated with authorized capital stock of $25,000, to manufacture machinery. The incorporators are Arthur B. Alling, Frederick H. Wiggin and I. Dwight Dana.

PERSONAL

George E. Day of Youngstown, Ohio, while on his winter vacation in California, was summoned recently to Washington to assume charge of oil well supply and tubular goods for the oil division of the Fuel Administration and has entered upon his duties as chief of oil well supplies. Mr. Day's long career in the steel business was inaugurated in 1882 when he became secretary and treasurer of the Hazen Co., iron factor, Cincinnati. He remained with that company until 1893, when he located in Chicago, forming the co-partnership of Casey & Day, general Western sales agents for manufacturers of steel rolling mill products of the Pittsburgh and Wheeling districts. Seven years later in 1900, when all of these companies had been absorbed in the various combinations which afterward went to form the United States Steel Corporation, Mr. Day, after a short time on the sales force of the Illinois Steel Co., accepted an offer from the then newly organized Youngstown Iron Sheet & Tube Co. of which he became general sales manager. He afterward was elected secretary and in 1913 became a member of the board of directors, which position he still holds. He retired from all active business Jan. 1, 1913, and since has divided his time about equally between his winter home in Pasadena, Cal., and his summer home in Youngstown.

GEORGE E. DAY

Herr Hugenberg, managing director of all the Krupp works in Germany, is about to resign for political reasons, says the London *Ironmonger*. He was formerly an official in the Ministry of Finance and became managing director of Krupps in October, 1909. He is also a member of the board of the Shantung Railway Co. and of the Westphalian Wire Industry. He was the real founder of the "Ala," the great advertising company of the German iron industry.

Ray P. Johnson, manager of the Warner Gear Co., Muncie, Ind., has been notified to be prepared to sail for France on two days' notice to engage in Government construction work.

Col. H. P. Bope, formerly vice-president and general manager of sales of the Carnegie Steel Co., Pittsburgh, has opened an office in room 639, Union Arcade Building, in that city.

S. H. Widdecombe, formerly connected with the New York office of Lewis F. Schoemaker & Co., Philadelphia, iron and steel, is now in charge of the Washington office of the company, in the Munsey Building.

Robert C. Moeller, sales agent American Steel & Wire Co. for the Worcester, Mass., district, has resigned to become general manager of the Collyear Insulated Wire Co., Pawtucket, R. I. Mr. Moeller had been connected with the American Steel & Wire Co. for 18 years.

P. W. Dillon, who has been secretary and general sales agent for the Northwestern Barb Wire Company during the past seven years, has been commissioned captain in the Quartermaster's Department, National Army, and is now located at Washington. Mr. Dillon is beyond the draft age, but has enlisted to do his bit.

Charles R. Putnam, for the past two years superintendent North Works, American Steel & Wire Co., Worcester, Mass., has been transferred to the Cleveland district works of that company. He is succeeded by J. Lester Perry, who has been superintendent of the South Works, Worcester. Peter Stewart, formerly assistant superintendent, becomes superintendent of the South Works; C. P. Vaill, formerly superintendent of the cable department, becomes assistant superintendent; and George Jones succeeds Mr. Vaill.

F. R. Gilpatric, superintendent of the box strapping department, Stanley Works, New Britain, Conn., has been promoted to office manager.

Earl B. Wilmar, office manager, Columbia Steel Co., Pittsburgh, Cal., has resigned and enlisted in the Signal Corps of the regular army. He is now at Camp Lewis, Washington.

Fred Clausen has been promoted to position of factory superintendent of the Independent Pneumatic Tool Co.'s plant at Aurora, Ill.

Robert S. Blake, formerly representative of the Condit Electric & Mfg. Co., Boston, in Pittsburgh, is now district manager for the Duquesne Electric & Mfg. Co. in its Chicago office, 230 South LaSalle street.

The International Oxygen Co., 115 Broadway, New York, announces the appointment of A. E. Ward as sales manager. Mr. Ward was formerly associated with the Prest-O-Lite Co.

Vilhelm Christensen of V. Lowener, Copenhagen, also 114 Liberty Street, New York, Stockholm, Christiania and Moscow, left this country for Copenhagen last week. Mr. Christensen for several years has been studying in the United States the use of modern small tools and appliances. He will join the tool department of the main office of V. Lowener in Copenhagen in order to stimulate the use of American tools in the Scandinavian countries.

Frank R. Whitehead, who was formerly purchasing agent of the United Steel & Metal Corporation, 15 Park Row, New York, has resigned to accept a similar position with the Emergency Fleet Corporation at Washington.

F. W. Ramsey, president Cleveland Metal Products Co., Cleveland, has been elected first vice-president of the Cleveland Chamber of Commerce.

Leon Belge, managing engineer for Philippe Berger, Paris, France, exporter and importer, will arrive in this country soon and will remain at the Waldorf-Astoria Hotel, New York, for three or four weeks, with a view to purchasing machine tools and other equipment for exportation to France after the war. At the same time he intends to study industrial and financial conditions in the United States. Mr. Belge will be glad to receive communications in care of the Waldorf-Astoria.

J. W. Barber, for many years in charge of the docks and mills of the Monongahela River Consolidated Coal & Coke Co., later consolidated with the Pittsburgh Coal Co., has become general manager of the Manown Mfg. Co., Pittsburgh, manufacturer of sleeves, nozzles and fire clay, succeeding C. H. Van Dyke, resigned.

Princess Furnace Co. Sold

The Princess Iron Corporation, recently chartered under the laws of Virginia and having offices in the North American Building, Philadelphia, has purchased the Princess Furnace Co., Glen Wilton, Va., and as soon as the legal details are completed will take over the Princess Furnace at Glen Wilton, which has an annual capacity of 12,000 tons of pig iron, and also the Callie Mining Co. and the Circle Ore Co., all being properties of the Princess Furnace Co., which had previously been owned by Matthew Addy & Co., predecessor of the present Matthew Addy Co. The recent sale was brought about by the desire to liquidate the old firm, which went out of business in March, 1915, and has been slowly liquidating. This is the last step in that process.

Permanent officers and directors of the Princess Iron Corporation have not been elected. No change in the operating force is contemplated, and General Manager J. Banks Hudson will continue in his present position. Charles E. Loxley will be prominent in the new corporation.

COLONEL BOLLING MISSING

Not Heard from Since He Left Amiens, France, Over Three Weeks Ago

Col. Raynal C. Bolling, general solicitor of the United States Steel Corporation, was reported "captured or missing" in the casualty list cabled by General Pershing and given out at Washington, Monday, April 15. All that is positively known in regard to the disappearance of Colonel Bolling is that he passed the night of March 24 at Amiens, France, and that he left that city in his own automobile with his chauffeur on the morning of March 25, going in a northeasterly direction. Nothing has been heard of him since that time. The most plausible theory is one advanced by a near friend, thoroughly in touch with conditions on the Western front, that, as he was returning from Amiens, he and his chauffeur were captured by German soldiers.

Colonel Bolling was born at Little Rock, Ark., in 1877. He graduated from Harvard in the class of 1900 and from Harvard Law School in 1902. He joined the legal staff of the United States Steel Corporation in Decemoer, 1903, and advanced rapidly until he became general solicitor several years ago, retaining that position when he entered military service. He married Miss Anna T. Phillips of Boston in 1906, and they have four children. His home is at Greenwich, Conn.

Colonel Bolling was interested in aviation long before the United States entered the war. In the summer

COL. RAYNAL C. BOLLING

of 1915, he organized and took to Plattsburg a machine gun battery. Some members of that battery, under his direction, formed an aviation squad, hired a small Gallaudet machine, and received instruction in flying at Plattsburg. This was the beginning of the First Aviation Section, Signal Corps, N. G. N. Y., which Colonel Bolling (then captain), under General O'Ryan's orders, organized at Mineola, N. Y., in November, 1915. This organization trained several fliers, and at the time of the disturbance on the Mexican border went into camp at Mineola, Long Island, and held itself in readiness for use in Mexico. Later Colonel Bolling resigned from the National Guard and in May, 1917, received a commission as major in the Officers' Reserve Corps. Immediately he formed the First Aero Squadron, with headquarters at Mineola; and in June, 1917, he was detached from command of the Aero Squadron and was sent to France on a special mission to investigate aircraft production abroad. The squadron, under command of Capt. Phillip A. Carroll, afterward became a part of the 26th Aero Squadron, American Expeditionary Force. He visited England and Italy, and returned to Paris, where he was placed in charge of the executive offices of the Aviation Section, Signal Corps, A. E. F., under General Pershing. He was promoted to the rank of Colonel, and remained at the Aviation Headquarters in Paris until March 12, 1918, when he was attached to the British Royal Flying Corps Headquarters for special training for command in the field.

Pig Iron Distributers Organize

The Merchant Pig Iron Distributers Association was formed at a meeting of pig iron distributers of the East at the Manufacturers' Club, Philadelphia, Tuesday afternoon. W. S. Pilling of Pilling & Crane, Philadelphia, was elected president and W. W. Hearne of the Matthew Addy Co. was elected secretary.

Three companies which are national distributers of iron, the Matthew Addy Co., Rogers, Brown & Co. and Hickman, Williams & Co., were represented, and it was planned to invite other Western distributers to join, so that the organization will be national in scope.

An Executive committee will be appointed consisting of five members, three from the East and two from the West.

There was discussion as to the advisability of asking the War Industries Board for a ruling to permit pig iron distributers to charge consumers a commission for service, but the opinion predominated that it was not wise to press this point in Washington at the present time.

The next meeting of the association will be held on May 14.

Carnegie Plate Output in March

The ouput of plates at its various mills in March by the Carnegie Steel Co., Pittsburgh, broke all records for any one month. At the Homestead steel works the 42-in. mill made 9685 tons, the 48-in. mill 18,477 tons, the 72-in. mill 8226 tons, the 84-in. mill 12,373 tons, the 110-in. mill, known as the Liberty Mill, and put in operation only a few months ago, made 17,240 tons, the 128-in. mill 18,643 tons and the 140-in. mill 21,569 tons, or a total for the Homestead works plate mills of 106,213 tons. At the Upper Union Mills there was turned out in one mill in March 4994 tons and on another mill 2037 tons of universal plates. At the Lower Union mills in Pittsburgh the 72-in. plate mill turned out in March 3361 tons of plates. At the Farrell, Pa., works there was turned out in March 4471 tons of plates, giving the Carnegie Steel Co. a total output of universal, sheared and ship plates in March of 121,076 tons, considerably the largest output of plates ever turned out by this company in any one month.

A largely attended meeting of the New England Foundrymen's Association was held at the Exchange Club, Boston, April 10. The members heard an interesting talk on "Cores and Corebinders" by C. S. Cleland, sales manager Black Products Co., New York. The speaker devoted considerable time to a discussion of the field of pitch binders, and his remarks brought forth a lively argument on the efficiency of various types of binders, which was participated in by many members. Thirteen new members were admitted to the association.

By an order from the Mexican Government, ascribed to the German influence that surrounds the Carranza administration, the large exports of scrap iron that have recently been made into San Francisco have been discontinued.

Liberty Loan Enthusiasm Is Great

Hundreds of Foreign-Born Workers Are Subscribing

Flag Awarded to Companies Employing 100 or More, All of Whom Subscribe, Already Awarded to Some Contestants —Treasury Officials Highly Pleased with the Outlook

WASHINGTON, April 16.—The third Liberty loan will probably pass the first billion-dollar mark before this issue of THE IRON AGE reaches its readers. Every indication supports the confident prediction of Treasury officials that the issue will be heavily oversubscribed. The confidence of Secretary McAdoo and his aids is not based upon mere optimism but is strongly supported by definite reports and detailed figures now pouring in from every part of the country.

Hundreds of communities had earned the right to fly Secretary McAdoo's honor flag before the formal taking of subscriptions began. This flag goes to the cities, towns and villages that oversubscribe their quota, and owing to energetic work done well in advance of the formal opening of the third bond sale many communities were canvassed in advance and pledged to their quotas before the real work of the campaign began.

As in the case of the first and second loans, New York is far in the lead of all other cities, and reports from the metropolis indicate that a record will be made, not only for the proportion of the total provided by the citizens of New York, but also in the percentage of oversubscription. While it is a favorite diversion for many congressmen and not a few senators to attack Wall Street and to criticise the business methods of New Yorkers, there is a notable absence of this loose talk when the Liberty loan drives are on, and only respectful comments are heard of the manner in which the big total of the metropolis is rolled up by her patriotic citizens.

So encouraging is the outlook for the heavy oversubscription of the third Liberty loan that the Treasury officials are preparing, in the event that the limit is exceeded by a substantial sum, to recommend to Congress the speedy passage of a joint resolution permitting income and excess profits taxes due and payable on June 15 to be paid in three equal installments; the first on June 15, the second on August 15, and the third on October 15. Two other considerations are influencing the department to take this action. The first of these is the practical certainty, based on returns already received, that the income and excess profits taxes will produce at least half a billion dollars more than was estimated. Certain conservative officials predict that the estimates will be exceeded by a round billion. The second consideration is the comparatively small total of disbursements for war purposes during the first quarter of the current calendar year. The extraordinary conditions prevailing in the leading manufacturing centers in January and February operated to reduce production, and as a result the drafts on the Treasury have been much smaller than was expected. Taking these elements into account, the Treasury officials have about reached the conclusion that the Government will have no use for the taxes accruing on June 15, and are disposed to agree with bankers and other business men who have suggested that it will be the part of wisdom not to withdraw such large sums from the channels of trade at one time but to provide for installment payments in the manner suggested.

Pittsburgh Subscriptions Heavy

PITTSBURGH, April 15.—The allotment of the third Liberty loan for Pittsburgh and Allegheny County is $82,000,000, and while no official figures have been given out it seems perfectly safe to say that Pittsburgh's allotment will be very largely oversubscribed. Very keen rivalry has developed in Pittsburgh for the honor of getting the 100 per cent Liberty loan flag, which is to be awarded to companies employing 100 men or more, all of whom subscribe to the third Liberty loan. Three companies have already won this flag, these being the Pittsburgh Transformer Co., the Neely Nut & Bolt Co. and the American Locomotive Co., officials having filed affidavits last week certifying that every employee on their payrolls was a subscriber to the loan. The Pittsburgh Transformer Co. was the first who filed this affidavit. A large number of other industrial concerns in the Pittsburgh district are so confident that they will win honor flags that they have already ordered flag poles, and are making arrangements to celebrate the flag raising.

Youngstown's Splendid Record

In the Youngstown, Ohio, district, where the large plants of the Youngstown Sheet & Tube Co., the Carnegie Steel Co., the Republic Iron & Steel Co., and Brier Hill Steel Co., and other concerns are located, Liberty loan drives are actively under way that promise splendid results. Everyday meetings of committee workers of the concerns noted above, and others, are held, at which progress on the drive is reported and plans made and discussed for getting the very highest results. Every employee of all the large and small industrial plants in the Youngstown district will be personally solicited and asked to buy a bond. Part of the committee canvasses the men employed on the day turns in the mills, and another part of the committee solicits the men working on the night turns. All the steel companies named above and other manufacturers in the Youngstown district are offering the Liberty loan bonds to the men on the deferred payment plan, whereby the men pay 10 per cent down on the bonds they buy, and 10 per cent per month until the bonds are paid for, at which time they are delivered to the subscribers. Roy Welsh, assistant to J. A. Campbell, president of Youngstown Sheet & Tube Co., reports the outlook for the purchase of bonds by the employees of his company as very satisfactory, and says that in many departments 100 per cent subscriptions will be given. He is in direct charge of the loan drive among the nearly 17,000 employees of the Youngstown Sheet & Tube Co. The response of foreigners in buying bonds has been most liberal, and in many cases they have paid cash for them.

W. H. Warren, general manager of the Brier Hill Steel Co., is in charge of the loan drive for that concern, and announces that subscriptions have been very liberal, and that the amount of bonds to be taken by the employees of his company will be very much larger than for the second loan.

Herman M. Hurd, treasurer of the Republic Iron & Steel Co., is in direct charge of the loan drive among its employees, and reports the outlook most gratifying. The men are buying the bonds freely, some taking larger subscriptions than in the second campaign. Youngstown made a notable record in selling Liberty bonds in the first and second campaigns, and promises

that its best previous records will be very greatly exceeded in the present one. Youngstown has also been a most liberal subscriber to Red Cross campaigns, and whenever called upon has always subscribed for more than double its allotment. The great industrial activity in the Youngstown district for the past two or three years has made that a very prosperous city, its laboring classes having been fully employed and obtaining the highest rate of wage they have ever earned. This puts the employees of the mills in good financial position to subscribe liberally for bonds, and they are doing so.

Youngstown Sheet & Tube Plan

As was the case in the first two Liberty Bond campaigns, employees of the Youngstown Sheet & Tube Co., Youngstown, Ohio, may purchase Liberty Loan Bonds of the third issue on the deferred payment plan, the money to be taken out of their wages. Further, they may turn in bonds previously purchased, if they desire. Each subscriber will be asked to sign a contract similar to that used in the other campaigns. Details of the general plan of campaign are under the direction of Roy Welsh, assistant to the president in charge of industrial relations.

A long list of committee workers has been compiled and they will assist in boosting the loan. General Manager C. S. Robinson, General Superintendent William C. Reilly, General Salesman William E. Manning, Assistant Treasurer W. J. Morris, Auditor J. J. Brant, and other officials, will serve on this committee. President James A. Campbell is at present in Hot Springs, Va., but upon his return will actively engage in the local campaign.

Because of the 15 per cent wage advance effective April 15 it is believed many workers will subscribe who otherwise might have hesitated. The advance comes at a particularly opportune time for the third loan, as employees can buy a good many bonds with the increase, without taking their resources. Under deferred payment arrangement workers will pay about 10 per cent down, and the remainder in monthly installments of about 10 per cent. In this case the company buys the bonds outright, subscribing for the aggregate subscriptions of the men, and when the latter pay for them they receive the certificates from the company.

Heald Machine Co. Campaign

The Heald Machine Co., grinding machinery, Worcester, Mass., initiated its Liberty bond campaign by passing out descriptive literature to all its foremen and by having foremen's meetings where the details of the loan were explained. The next step was to give application slips to the foremen who passed them around to the workmen in their departments. After a short period these slips are to be collected, assorted and checked from the payroll. This gives a list of the men who have not subscribed and a follow-up scheme is being put into effect by which a personal visit is made to each man on this list. Specially careful checking is being done to ascertain the men who subscribed to the first issue of bonds, but did not subscribe to the second issue, as the payments on the first issue will soon be out of the way and these men are being particularly sought as subscribers for the third issue. It is evident in many cases that the follow-up system works nicely, as it reaches the men who are out at the time of the first solicitation or those who are glad to subscribe when the plan is clearly explained to them.

As in past campaigns, the amounts taken out by the different departments will be posted, and it is expected that the competition will result in enlarging some of the subscriptions. Care is being taken in soliciting for this issue to see that men do not subscribe for a larger amount than their income, as shown by the payroll, will warrant. This is an outcome of the experience of the first two campaigns where, in their enthusiasm, several men subscribed for larger amounts than they were able to carry. In posting the weekly results not only is the amount in dollars shown but also the percentage of men in each department who have subscribed. This puts the small departments on an equal footing with the large ones. In past campaigns a quota was established at the beginning and it was found necessary to enlarge the quota in order to keep work ahead of the committee. This quota was expanded beyond the original amount assigned and the same plan will be followed this time, if subscriptions keep up at the pace at which they have started. In past campaigns the company has offered to take weekly payments from the pay envelopes each week and many of the men took advantage of this offer, but plans have been practically completed this time to turn the work over to a local branch of one of the city's savings banks. In the second campaign, it was found possible to bring the percentage of subscriptions up to 93.

Hartford Liberty Loan Campaign

The general campaign in the city of Hartford, Conn., for the sale of the second Liberty bond was carried out in group form. The present campaign is by much the same method. The insurance companies, banks and business firms had their own particular organization, each pursuing a plan best designed to meet the conditions within that group. A special committee of manufacturers, consisting of three members, had charge of the campaign in the factories.

The procedure was uniform in all of the big plants. First artistic displays of posters were made in the dining and other rooms, and explanatory literature was circulated. Each factory was furnished a printed outline of the plan of campaign. A captain and assistant were appointed in each room, and this has the effect of producing rivalry. Every pay day the assistants solicited contributions from the workers and made their report to the captains.

In the meanwhile, speakers were introduced each noon in the dining room of the plant, also evenings where overtime work was being carried on. The addresses were made in various languages. In many instances the heads of the plant addressed the working force. In some cases the Liberty Loan and other war fund drives have had musical settings, the shop quartet or chorus singing patriotic airs during the rally hour. The National airs of the Allies were rendered by phonograph. In some shops girls acted as solicitors, going among the men, and they never took "no" for an answer. The city raised $23,500,000, a surplus of $7,000,000 beyond the maximum asked, and of this amount the factories contributed $1,371,700.

Chicago Making Good Progress

CHICAGO, April 15.—The leaders among those of the iron and steel trade who are working for an over-subscription to the third bond issue, report that good progress is being made, although in many cases definite returns cannot be given for the reason that totals embracing employees' subscriptions are not completed.

The Inland Steel Co. has subscribed for bonds of the third issue to the amount of $1,200,000, and when its office forces and mill workers have been completely canvassed it is expected that the company's total will be around $1,500,000.

What the Illinois Steel Co. does will be announced in New York. The Interstate Iron & Steel Co. has signed up about 95 per cent of its employees, and is working on the remaining 5 per cent.

Freyn & Co., engineers and contractors, have subscribed $25,000 to the third Liberty loan, in addition to holdings of $15,000 of the first issue of bonds and $40,000 of the second issue.

Speakers in foreign languages furnished by the Liberty Loan Committee have been much cheered by the reception they have received from foreign-born workers at the steel plants. Polish, Italian, Bohemian and even Hungarian and Austrian workers have taken bonds to an extent that almost matches what has been done by natives of this country. The work of organizing internal committees within the larger works to boost subscriptions is nearing completion, and it is be-

ing helped by the willingness of company executives to have bond payments handled through company paymasters.

Some of the larger subscriptions follow:

Inland Steel Co.	$1,200,000
Freyn & Co.	25,000
American Radiator Co.	500,000
Advance Rumely Co.	500,000
Crane Co.	400,000
American Steel Foundries	100,000
Standard Forgings Co.	100,000
Buda Co.	75,000

Liberal Response in Cleveland

CLEVELAND, April 15.—Subscriptions to the Liberty loan in Cleveland from industrial workers during the first week of the campaign were very heavy and the industrial committee having supervision of this part of the Cleveland Liberty Loan compaign is highly gratified by the liberal response from the men in the shops. Each plant is being thoroughly canvassed by members of its own organization, and these make their report to the industrial committee. At the opening of the compaign the industrial committee set 100,000 as the mark it hoped to reach in the number of subscriptions from workers in industrial plants, and it is confident that this number will be easily reached. During the second loan campaign about 50 per cent of the wage earners in the shops subscribed for bonds. It is predicted that this number will be increased to 75 per cent in the present campaign.

Subscriptions from large manufacturers are not coming out as rapidly as had been hoped for, but many of the large subscribers are doubtless waiting to make their subscriptions during the latter part of the campaign, as they did during the previous Liberty loan drives. Among the larger subscriptions already made by companies associated with the iron and steel and metal-working field are the following:

Inland Steel Co.	$1,200,000
Struthers Furnace Co.	100,000
Geo. Worthington Co.	100,000
Eberhard Mfg. Co.	100,000
Austin Co.	100,000
Cleveland Metal Products Co.	100,000
National Acme Co.	100,000
Cleveland Automatic Machine Co.	75,000
Motch & Merryweather Machinery Co.	50,000
National Malleable Castings Co.	50,000
Bialosky Brothers Co.	50,000
Brown Hoisting Machinery Co.	50,000
Standard Parts Co.	50,000
Champion Rivet Co.	50,000
Cleveland Hardware Co.	50,000
Hydraulic Pressed Steel Co.	30,000
Steel Products Co.	25,000
Torbenson Axle Co.	20,000
W. M. Pattison Supply Co.	15,000
Max McMurray	10,000
American Can Co.	10,000
International Steel Tie Co.	10,000
Crucible Steel Co.	10,000
Gas Machinery Co.	8,250

Detroit Already Oversubscribed

DETROIT, April 15.—This city took just five days to oversubscribe its quota of the third Liberty loan. The compaign started Monday morning, April 8, and Friday noon the committee in charge announced that Detroit had gone $2,000,000 over its quota of $36,800,000. The executive committee expects Detroit will pile up a total of $55,000,000 or $60,000,000. The campaign will continue actively until Thursday evening, April 18.

The Henry Ford interests bought $6,000,000 of the bonds. The Great Lakes Engineering Works and Dodge Brothers took $1,000,000 each. In addition, 14 banks took a total of about $12,000,000.

With scarcely an exception the factories which have already canvassed their employees report that the workmen are taking from 15 to 100 per cent more bonds than on either of the preceding issues.

Factories were systematically worked by teams from headquarters, aided by the factory foreman. The method which has proved most successful has been to "sell" the foremen on the bond issue at a mass meeting before the factory compaign. The foremen are then responsible for "selling" the men in their departments. They are aided in this by the salesmen from headquarters, speakers, bands, bugle corps and anything else which can be supplied to invoke enthusiasm.

Employees of about one-half of the Detroit factories have already taken nearly $10,000,000 worth of bonds.

New York Subscriptions

NEW YORK, April 16.—In addition to the subscriptions of the United States Steel Corporation of $25,000,000 for the Corporation and $10,000,000 to be offered to employees on an installment plan and the subscription of $2,050,000 of the Republic Iron & Steel Co. mentioned in THE IRON AGE of last week, other subscriptions received in New York were as follows:

American Locomotive Co.	$1,000,000
Niles-Bement-Pond Co.	500,000
New York Shipbuilding Corp.	100,000
E. I. Du Pont de Nemours & Co.	4,000,000
Charles M. Schwab	1,000,000
International Nickel Co. (additional)	250,000
Midvale Steel & Ordnance Co.	2,000,000
Phelps-Dodge Corporation	700,000
Underwood Typewriter Co.	600,000
E. I. Du Pont de Nemours (additional)	500,000
Railway Steel Spring Co.	500,000
Pratt & Whitney Co.	500,000
Lidgerwood Mfg. Co.	125,000
New Jersey Zinc Co.	1,000,000

Great Milwaukee Parade

MILWAUKEE, WIS., April 15.—Milwaukee's third Liberty loan campaign officially commenced to-day, although for a week's time solicitation work has been going on in all sections, including the metal-working industry. The campaign formally was introduced on Saturday, April 13, when more than 35,000 citizens participated in a patriotic demonstration and parade which in size, numbers and enthusiasm exceeded previous demonstrations of this character. A feature of the parade was the participation of all of the 750 or more employees of the Wisconsin Gun Co., organized by five Milwaukee manufacturers at the request of the Government to build 3-in. field pieces. Other important metal-working concerns also were represented by large marching delegations in units. A half holiday was generally declared to make possible a representative participation.

The subscription by the Chain Belt Co., Milwaukee, to $100,000 of Liberty bonds of the third issue was authorized by the board of directors at its meeting on April 10. Numerous other large subscriptions were placed in the hands of Richard P. Tell, chairman of the metal trades section, during the week to be reported among the purchases of the first day of the campaign. The response to the appeal for liberal support of the third loan already is such that there seems to be no doubt that Milwaukee will again largely oversubscribe her quota, as it did on the first and second loans and the various forms of war work funds.

Buffalo Iron and Steel Men Active

BUFFALO, April 15.—The chairman of the Steel Industries Committee at Buffalo, Henry D. Miles of the Buffalo Foundry & Machine Co., states that the campaign for the loan is making very satisfactory progress and that the spirit of patriotism shown is marvelous. The Lackawanna Steel Co. has authorized the announcement of its subscription of $1,000,000, which is to be credited equally between the Buffalo and the New York committees. Some other large subscriptions have been made, but the committee is not yet ready to make the announcements. They will be in shape for summing up within a few days. The list includes a number of $100,000 and $150,000 amounts.

Frank Moll, secretary of the committee, reports that the employees in many of the plants and shops of the

iron and steel industries of the district which have so far been systematically solicited are doing better than they did on the second Liberty loan.

The names of two members of the Buffalo committee, who are giving efficient aid to the convass, were through oversight omitted from the list of members of the committee published last week. They are: George W. Donovan, Buffalo representative of the American Rolling Mill Co., and Guy A. Hagar, district sales manager, Lackawanna Steel Co.

The Scrap Metal and Waste Material Dealers' Association of the city has a special solicitation committee for the loan, of which Harry Roblin, president of the Manufacturers' Outlet Co., is the chairman. The committee representing this association raised over $200,000 in the second Liberty loan campaign, and expects to beat that record.

Kansas City Company's Record

As indicating the patriotism of iron workers, here is the record for the three Liberty loans of the Kansas City Bolt & Nut Co., Kansas City, Mo.:

First loan.....$22,950—225 names
Second loan..... 29,400—339 names
Third loan..... 63,650—583 names

The company underwrites without interest the employees' bonds, and subscribed to the third Liberty loan $50,000.

Is There a Steel Plate Shortage?

(*Continued from page* 1015)

for the failure. The supply is far less than the demand; that is the answer.

Mr. Hurley. Well, we all agree that there was a shortage of fuel last winter.

Mr. Replogle. There is a shortage now.

Mr. Hurley. There will be one for about 30 days.

Mr. Replogle. There will be a shortage for months.

Shipping Plates to Far West and Back

Senator Vardaman here reverted to the shipment of plates from the East as far west as Omaha and Nebraska for fabrication, which appeared to him to account for some of the difficulties of the fabricated shipyards. Mr. Replogle reminded Mr. Hurley that the shipping board had been warned of the danger of sending plates so far west for fabrication, and added:

"And that is the steel, to-day, Mr. Hurley, that is being delayed. There is a big jam there which was inevitable, with 2000 or 3000 miles of transportation."

"There is no doubt that transportation delays have entered into the non-delivery of steel," replied Mr. Hurley.

"That has now been corrected," continued Mr. Replogle, "and I have no doubt since Mr. Hurley has taken charge it is going to be prevented hereafter. In spite of the shortage of plates, however, we will see that the Emergency Fleet Corporation gets sufficient to meet their demands if we know the requirements at each yard."

Fleet Corporation Will Co-operate

"You say that you have not a list of the shortages in the different yards so that you can follow it up with the steel mills?" asked Mr. Hurley.

"No, sir," replied Mr. Replogle, "I have no such list."

"I will see that that is done before half past four this afternoon," said Mr. Hurley with much emphasis.

"Do you think that will relieve the situation?" asked Senator Harding.

"I think it will," answered Mr. Replogle, "but it will probably take three or four weeks before it is absolutely corrected."

Subsequently, in reply to questions from Mr. Hurley, Mr. Replogle reiterated his opinion that there is to-day an actual shortage of plates, which accounts for the difficulty that has been experienced in securing plates for other purposes than for shipbuilding. Mr. Hurley appeared to be skeptical on this point, whereupon Mr. Replogle demanded:

"Where have the plates gone? You cannot tell me of one ton of plates that were used for anything but important Government work."

"Well, I say that there is a difference of opinion," retorted Mr. Hurley. "Here is one of a group of steel men saying there are plenty of plates and here you say there is not."

"If there are plenty of plates," rejoined Mr. Replogle, "what excuse is there for non-delivery of them?"

"If I understand Mr. Hurley correctly, he has the impression that some of the non-essential business is getting the steel," commented Senator Harding. "Is that right?"

"Yes," said Mr. Hurley, "I feel that the plates for ships have not been given the consideration that they are entitled to."

"Probably there are old contracts outstanding," suggested Chairman Fletcher, "and the steel people are supplying those commercial contracts."

Can't Roll 100 Per Cent of Ship Plates

"No, sir, that is incorrect," replied Mr. Replogle. "We followed that up. I want to make it plain, however, that the total tonnage of any plate mill cannot be applied on your orders. You know the character of your orders and that your specifications call for certain tests and that in addition there are the Lloyds specifications to be met. Then fuel is a big factor, for where a high amount of coal is used it throws the lot out. Now, we send the waste that will not do for you to other people. You cannot work 100 per cent on United States Government material. No plate mill can do it and they are applying those rejected pieces to tanks and cars and other work."

"Have you found any plate mill where you have placed an order where they have shipped any other orders in preference?" asked Mr. Hurley.

"Absolutely none," replied Mr. Replogle.

"So they are all working 100 per cent?"

"Absolutely."

Mr. Replogle Cites the Records

In support of his statement that the Emergency Fleet Corporation had taken over the work of following up ship-plate orders with the steel mills and fabricating shops and had announced that it was not the business of the War Industries Board or the American Iron and Steel Institute to act as expediting agencies, Mr. Replogle put into the record the following letter addressed to the Submarine Boat Corporation under date of Jan. 15, 1918, by Frank A. Browne, general purchasing officer of the Fleet Corporation:

GENTLEMEN: We are inclosing herewith copies of letters, dated Jan. 11 and 12, from the American Iron and Steel Institute to Mr. Ackerson, assistant to the vice-president and general manager of the Emergency Fleet Corporation. Mr. Ackerson has requested me to take this matter up with you for the purpose of straightening out the matters referred to in the attached correspondence.

It is not the function of either the War Industries Board or the American Iron and Steel Institute to act as expediting agencies for the numerous orders placed by shipbuilders with the steel mills. The Purchasing Division of the Emergency

Fleet Corporation has an expediting department organized for the specific purpose of aiding shipbuilders and others in obtaining materials. We would request, therefore, that you communicate directly with the steel mills in regard to expediting your orders. If you fail to obtain satisfactory results from the steel companies, you should take the matter up immediately with the Purchasing Division of the Emergency Fleet Corporation, and we will be very glad to give you any assistance within our power.

In letter of Jan. 12 from the American Iron and Steel Institute to Mr. Ackerson complaint is made as to the irregular way in which your company submits its orders to the steel mills, making it necessary for the steel mills to hold open capacity which they have reserved for you, thus reducing their output. Please give this matter your careful attention and avoid holding open tonnage without specifying against it, so that steel mills may, as far as possible, operate to maximum capacity.

Mr. Replogle said that a similar letter was sent to several other yards and he assumed that all shipbuilders received them.

Shipments in Excess of Requirements

Mr. Replogle also introduced in the record the letter referred to in his testimony as having been written by him under date of April 4, 1918, to Charles Piez, vice-president and general manager of the Fleet Corporation, as follows:

MY DEAR MR. PIEZ: We confirm our verbal request to you and a number of your representatives, that if we are given detailed information as to your monthly requirements at each of your various shipyards they will be promptly cared for.

I inclose memorandum showing shipments to the Emergency Fleet Corporation as taken from the signed reports of the various steel manufacturers for each week, Jan. 5 to March 30, inclusive, from which you will note that the shipments for five weeks ending Feb. 2, which would really be January delivery, 106,594 tons of plates and 175,943 tons of all kinds of steel, including plates, shapes and bars, were shipped to you. In the four weeks ending March 2, which would cover February shipments, 125,526 tons of plates were shipped and 209,383 tons total steel.

In the four weeks ending March 30, 142,261 tons of plates were shipped and 232,851 tons total steel.

Your total requirements of steel as given by F. A. Browne, general purchasing officer, under date of March 16, were 180,761 tons in Jan., 1918, 181,694 tons in February, and 227,973 tons in March, or a total for the first quarter of this year of 590,428 tons, as compared with shipments during this period of 618,177 tons, or approximately 27,000 tons in excess of your estimated requirements, despite the fact that during this time all of the plate mills were greatly restricted in their output on account of their utter inability to secure fuel. Most of them were running at times at about 40 per cent capacity and at least one of them, Worth Brothers' plant at Coatesville, being shut down for over one month, despite every effort made with the fuel and railroad administrations to give them relief.

A study of the above figures, however, makes it plain that if any serious shortage exists it is due to the following causes:

The placing many months ago by the Emergency Fleet Corporation of orders with the steel mills at Coatesville, Pottstown, Bethlehem, and other Eastern points for shipment to fabricating plants in the Chicago district and far west as Kansas City for fabrication of material later to be delivered at your Philadelphia shipyards, involving the transportation of material thousands of miles before reaching the shipyard, with the inevitable delays in delivery, as we pointed out to Mr. Hurley in our letter to him of Nov. 28, 1917, and which you acknowledged under date of Dec. 18, 1917, advising that Mr. Charles Day would have charge of your production department and that it would be one of his functions to keep in touch with us on the subject of apportioning steel, in order to prevent the condition which has now arisen. I might state that Mr. Day to my knowledge has never been to this office nor consulted us in any way.

Practically all of your shipyards are urging for delivery of material and many of them are demanding very much more than they can use, which condition is sure to result in further complicating the already badly congested traffic situation, and it is very plain to the writer that your requirements can be met 100 per cent if we are given an intelligent estimate of your requirements per month for each yard.

We have not had this information, despite repeated requests for it, and I trust that you will furnish it at the earliest possible date, as otherwise the existing situation can not be corrected.

It is the feeling among members of the Senate Commerce Committee that Mr. Replogle's testimony has cleared the atmosphere to a marked extent and that hereafter the Shipping Board will supply the War Industries Board with all information necessary to follow up orders and to see that material is delivered in proper sequence; also that the shipyards will specify promptly against all standing orders so as to avoid tying up productive capacity. Both the Fuel Administration and the office of the Director General of Railroads will be served with copies of Mr. Replogle's testimony and will be expected to do everything in their power to provide coal, coke and transportation not only for the plate mills and fabricating shops working on ship material, but also for every branch of the iron and steel industry engaged upon war contracts. W. L. C.

LABOR BOARD FORMED

President Wilson Urges Co-operation of All Employers and Employees

WASHINGTON, April 16.—By presidential proclamation the War Labor Conference Board appointed early in January for the purpose of devising for the period of the war a method of labor adjustment which would be acceptable to employers and employees has been constituted a National War Labor Board whose duty it shall be to adjust labor disputes that may arise in fields of production necessary for the effective conduct of the war or in other fields of national activity, obstruction of which might affect detrimentally such production. The membership of the board, as reappointed with new functions, includes ex-President William Howard Taft and Frank P. Walsh, representatives of the general public of the United States; Loyall Z. Osborne, L. F. Loree, W. H. Van Dervoort, C. E. Michael and B. L. Worden, representatives of the employers of the United States, and Frank J. Hayes, William L. Hutcheson, William H. Johnston, Victor A. Olander and T. A. Richert, representatives of the employees of the United States.

The powers, functions and duties of the National War Labor Board, as set forth in the President's proclamation, are as follows: To settle by mediation and conciliation controversies arising between employers and workers in fields of production necessary for the effective conduct of the war, or in other fields of national activity, delays and obstructions which might, in the opinion of the National Board, affect detrimentally such production; to provide, by direct appointment or otherwise, for committees or boards to sit in various parts of the country where controversies arise and secure settlement by local mediation and conciliation; and to summon the parties to controversies for hearing and action by the National Board in event of failure to secure settlement by mediation and conciliation.

Ohio Company Expanding

The Trumbull Steel Co. of Warren, Ohio, at a meeting of directors, April 15, decided to increase its capital stock from $12,000,000 to $20,000,000. The additional capital will all be common stock and the company will have $8,000,000 preferred and $12,000,000 common stock. Part of the new issue will be used in plant extensions now under way, which include an open-hearth steel works and also for further extensions not fully decided upon, which may eventually include one or two blast furnaces. At present the Trumbull Steel Co. has 21 tin plate mills and 12 hot sheet mills. The company is building seven open-hearth furnaces, of which two have been finished. It is the third largest independent producer of tin plate in the country.

The National Association of Stove Manufacturers will hold its annual meeting at the Hotel Astor, New York, May 8 and 9.

Machinery Markets and News of the Works

BEHIND ON DELIVERIES

Makers of Lathes Hold Up War Work

Speeding Up in All Branches of Government Activity Is Noted in Machine-Tool Markets

Government work, particularly on guns, is being delayed by slow deliveries of boring and turning lathes and other large tools. Makers of these tools have been unable to keep their promises on deliveries, they say, because of the loss of labor through the draft, delays in getting castings from foundries and the congested condition of the railroads. In one instance a $2,000 express charge was paid on a large machine to insure its prompt delivery.

Many more large tools will be required for the new gun program of the Ordnance Bureau of the War Department and there appear to be no prospects of getting deliveries on this new equipment short of 12 months. An order has been placed in Cincinnati for four lathes, each having a 240-ft. bed, probably the largest lathes ever built.

The Wright-Martin Aircraft Corporation, New Brunswick, N. J., advised the machine-tool trade on Monday that orders would be placed this week on its recent list of about 500 tools. This business has been pending for several weeks and is the first indication of a speeding up in the airplane program. The Wright-Martin corporation will build or purchase a plant for making an additional number of Hispano-Suiza motors. Production of Liberty motors will probably also be speeded up by the purchase of new equipment by plants engaged on such contracts.

Shipbuilding companies are buying more actively, new equipment will be bought for increased shell production, while the production of mechanical stokers for the 3000 locomotives to be ordered by the railroad administration will create a few hundred thousand dollars' worth of machine-tool business.

The American Steel & Forge Corporation is seeking equipment in Philadelphia for a plant to make shafts for turbines. The Bethlehem Steel Co. wants several large lathes. The C. H. Wheeler Mfg. Co., Philadelphia, has bought about 20 new tools for making condensers. Machine-shop equipment for Government ordnance bases has been bought in Philadelphia.

Crane business is not active, though a few large deals have been figured on. The McMyler Interstate Co., Bedford, Ohio, has taken an order for 28 locomotive cranes for the Hog Island shipyard of the American International Shipbuilding Corporation and the Tennessee Coal, Iron & Railroad Co. is seeking 15 cranes in Pittsburgh for its shipyard near Mobile, Ala.

New York

NEW YORK, April 16.

There are more indications this week that the authorities in Washington are speeding up war preparations in practically every branch. It was believed in the trade that the reorganization going on in the Aircraft Board might delay the placing of orders for machine tools for making motors, but instead of that, it appears that motor work will be speeded up. The Wright-Martin Aircraft Corporation, New Brunswick, N. J., has been awaiting for weeks instructions to go ahead on a new contract for Hispano-Suiza aviation motors, and this word was finally received last week, with the result that the buying of about 500 tools was begun this week. Production of Liberty motors will doubtless also be increased. It is understood that the Lincoln Motor Co., Detroit, may purchase additional equipment. Three sites are being considered by the Wright-Martin Corporation for a new plant, one in Philadelphia, one near Atlantic City, N. J., and at Poughkeepsie, N. Y.

The new gun program of the Ordnance Bureau of the War Department is said to be practically decided upon and it is expected in the trade that contracts will be placed in about two weeks. A large number of guns to be mounted on railroad trucks will be ordered, but it will require at least 12 months to obtain some of the large tools needed for machining. Completed guns cannot be expected before the late summer or fall of 1919. New shell production will also have to be provided for, as the guns to be built are as large as 16 in. and no shells of that size are now being manufactured in this country.

Delays in delivery of large tools principally gun-boring and gun-turning lathes are delaying production of important work for the War Department and Navy Department. The labor situation is a factor in preventing machine-tool builders from keeping their promises on deliveries. Many men have been lost in the drafts for the Army and it has not been possible to replace this labor. It is intimated that the Government may find it necessary to recruit labor for machine-tool builders who are unable to maintain their delivery schedules. Some builders of lighter tools are in such an easy position that they can make deliveries from stock, and it is pointed out that their mechanics would serve the country much better in plants whose products are much more essential at the present juncture in producing artillery and other war material requiring large tools. The shortage of pig iron is affecting some machine-tool builders, as there are delays in receiving castings.

The American Can Co. will shortly place large orders for increasing the shell output at its Edgewater, N. J., plant.

The Ingersoll-Rand Co., New York, may soon close a contract to make recoil mechanisms for 75-mm. guns. Purchases of the Singer Sewing Machine Co., New York, recently for a similar contract aggregated more than $1,000,000.

Part of the work placed with Walter Scott & Co., Plainfield, N. J., which consisted largely of gun carriages, has been transferred to R. Hoe & Co., New York, and machine tools on order for the Scott plant will be shipped to the Hoe plant. The change was made to speed up production.

The Eisemann Magneto Co., Brooklyn, has purchased about $50,000 worth of tools.

The New York Shipbuilding Corporation, Camden, N. J., is in the market for five punching machines. The Atlantic Corporation has purchased considerable equipment in the past week for its shipyard at Portsmouth, N. H. The Bartlett Hayward Co., Baltimore, Md., has bought a number of punches and shears for the manufacture of tanks.

The Aberdeen Proving Ground, Aberdeen, Md., has placed orders in this market for machine-shop equipment.

Crane inquiry is exceedingly light. The Lundin Steel Castings Co., Neponsit, Mass., is in the market for a 5-ton crane. The American Locomobile Co. wants a 10-ton crane for its Schenectady, N. Y., works. J. N. Kinney, 30 Church Street, has received an order from the Thompson-Starrett Co., New York, for eight 6-ton hoists, with trolleys, for the Government powder plant it is building at Charleston, W. Va.

The Link Tool & Machine Corporation, New York, has been incorporated with a capital of $25,000. A. S. Aleinikoff, 865 West 180th Street; G. Shiloff, 558 East 191st Street, New York; and H. J. Buierman, 762 Greene Avenue, Brooklyn, are the incorporators.

The American Gas Appliance Co., Brooklyn, has been incorporated with a capital of $50,000 by J. B. and P. A. Slattery, 108 Lawrence Street, Brooklyn, and D. E. Byrne, Summit, N. J.

The Upson-Walton Co., 291 Broadway, New York, manufacturer of wire rope, etc., has increased its capital from $100,000 to $500,000.

The Ross Axle Corporation, New York, has been incorporated with a capital of $90,000 by T. K. Peters, 9 East Forty-third Street; J. W. Lovell, 516 Fifth Avenue, and B. Anderson, 160 Broadway.

The Eagle Pencil Co., 703 East Thirteenth Street, New York, has acquired sixteen lots adjoining its plant, giving the company the entire block from Avenue C to Avenue D, between East Thirteenth and Fourteenth streets. The site is now occupied by one, two and three-story buildings, with total area 188 x 205 ft., and will be used for extensions.

The American Steel Export Companies Brazilian Corporation, New York, has been incorporated with a capital of $20,000 by A. G. Logan, E. W. Stuart and D. E. Hanlon, 30 West Ninth Street.

The new building, one and two stories, 200 x 300 ft., to be erected on New Brunswick Avenue, Rahway, N. J., by the National Pneumatic Co., 50 Church Street, New York, will be equipped as a machine shop and for general manufacturing.

The Hauck Mfg. Co., 113 Eleventh Street, Brooklyn, manufacturer of oil burners, etc., has purchased five city lots on Tenth Street near Second Avenue, for a proposed addition.

The Kings County Electric Light & Power Co., 360 Pearl Street, Brooklyn, has applied to the Public Service Commission for permission to issue bonds for $1,000,000, for extensions and betterments in its plants.

Ira S. Bushey & Sons, 764 Court Street, Brooklyn, operating a ship works at the foot of Twentieth Street, have acquired a block of property on Court Street, fronting about 500 ft. on the Gowanus Canal, as a site for a new plant.

The Gifford-Wood Co., Hudson, N. Y., manufacturer of coal and ash handling machinery, castings, etc., has increased its capital from $300,000 to $600,000.

The Saugerties Foundry & Machine Co., Saugerties, N. Y., which has recently incorporated its business with a capital of $20,000, has plans on the way for increasing its production. A New York office will be maintained at 489 Broome Street.

The Superior Meter Co., Jersey City, manufacturer of meters, has increased its capital from $30,000 to $75,000.

The Burnrite Briquette Co., Newark, has acquired about three acres on New Jersey Railroad Avenue between Vanderpool and Earl Streets and Avenue A, and plans the erection of a plant for the manufacture of coal briquettes. W. H. Crossman is president.

The Tank-Ship Building Corporation, Newburgh, N. Y., has installed an annealing furnace for bending plates and for tank-ship construction. H. Buchanan is superintendent The company maintains a New York office at 120 Broadway.

The Morgan Machine Co., manufacturer of box-making, nailing machinery, etc., University Avenue and Culver Road, Rochester, has taken out a permit for the construction of an addition to its erecting floor which will be 74 x 100 ft., and cost about $25,000. Part of the space will be used for storage. H. W. Morgan is vice-president and general manager.

Charles E. McGill, manufacturer of tools, dies and machinery, 34 Commercial Avenue, Binghamton, has started the construction of a one-story machine shop, 48 x 84 feet, on a site 189 × 213 ft., at Floral Avenue and the Delaware, Lackawanna & Western Railroad. It is the plan to manufacture machine tools and dies and later on a foundry will be added. He will be in the market for additional equipment of all kinds. Charles E. McGill is head of the new organization and Harry E. Holford, until recently mechanical engineer and chief draughtsman at the Fairbank Co.'s local plant, is associated with him.

The Mayer Coating Machines Co., manufacturer of paper-coating machinery, Rochester, N. Y., is about to erect a factory two miles outside the city limits to employ 200 workers. It is in the market for an automatic steam engine power plant. C. W. Mayer is treasurer.

The Alberger Pump & Condenser Co., 140 Cedar Street, New York, has purchased several acres of additional property in Newburgh, where it has a plant; but does not contemplate erecting any buildings in the immediate future. W. R. Wilson is secretary.

The British-American Metals Co., 52 Vanderbilt Avenue, New York, has purchased the former works of the Manganese Steel Safe Co., Plainfield, N. J., from the Taylor-Wharton Iron & Steel Co., High Bridge, N. J. The new owner will establish a plant for the manufacture of ship fittings and heavy marine hardware, and plans the immediate installation of machinery and equipment for this purpose. While the plant is in good condition, it is said that following the inauguration of operations, improvements will be made to facilitate production. The site consists of about 10 acres.

Charles Miller, 334 Graham Avenue, Brooklyn, has had plans prepared for a one-story forge shop, 25 x 100 ft., on Maspeth Street.

The National Marine Equipment Co., New York, has been incorporated with a capital of $100,000 by S. Slaff, H. Kramer and G. D. Orlove, 838 Kelly Street, to manufacture ship fittings, etc.

The Leinert Engineering Co., New York, has been incorporated with a capital of $25,000 by W. Leinert, 410 West Twenty-third Street, New York; W. A. Burtenshaw and C. J. Quinn, to manufacture machinery.

The John Simmons Co., 110 Centre Street, New York, manufacturer of steam specialities, plumbers' supplies, etc., has acquired an entire city block in the Degnon Terminal section, Long Island City, extending from Nott Avenue and Manly Street to Anable Avenue and Orton Street, for a new plant. Its present works are now at New York, Newark, N. J., and Erie, Pa.

William S. Doig, Inc., 54 Franklin Street, Brooklyn, heretofore operating as the Estate of William S. Doig, has been incorporated with a capital of $500,000 to manufacture box-nailing and other machinery. E. Doig, 996 Park Place and J. Doig, 1036 St. John's Place, Brooklyn, and M. D. Thedford are the incorporators.

The Railway & Power Equipment Corporation, New York, has been incorporated with a capital of $100,000 by A. G. Logan, D. E. Hanlon, 30 West Ninth Street, and E. W. Stuart.

Edward Ehrbar, Inc., New York, has been incorporated with a capital of $75,000 to manufacture machinery, hardware, etc. Edward Ehrbar, 490 East Twenty-eighth Street; A. J. Kennedy and O. A. Lewellen are the incorporators.

The Gerrard Wire Tying Machines Co., New York, has been incorporated with a capital of $350,000 by M. Zan, 255 Fort Washington Avenue, P. V. Giroux, 305 West Seventy-first Street, New York; and T. H. Ozmon, Woodhaven, to manufacture machinery and wire specialties.

A chain of 40 garages, it is stated, will be constructed by A. W. Schmidt, 3621 Avenue G, Brooklyn, with central machine shop for repair work on Rogers near Newkirk Avenue.

The Foundation Co., 233 Broadway, New York, is said to have closed negotiations with the Reid Wrecking Co., Port Huron, Mich., for the acquisition of its shipbuilding plant there. The Reid company will be merged with the purchasing organization, and the present works reconstructed and extended.

The Coating & Stripe Machine Co., New York, has been incorporated with a capital of $100,000 by J. P. Bourke, A. A. Feinberg and G. Galiani, 220 Broadway, to manufacture machinery for waterproofing and fireproofing materials, etc.

The Tri Ton Trailer Corporation, New York, has been incorporated with a capital of $150,000 to manufacture motor trailers. O. D. Shonnard, C. Hoffman, 250 West Fifty-fourth Street; and A. L. Fullman, 302 Broadway, are the incorporators.

The American Balsa Corporation, 30 East Forty-second Street, New York, is planning for a one-story plant, 60 x 75 ft., at the Harlem River and 152d Street.

The Welin Marine Equipment Co., Vernon Avenue, Long Island City, manufacturer of lifeboats, etc., is building an extension to its plant, estimated to cost about $25,000.

The Cast Steel Ship Co., New York, has been incorporated with a capital of $250,000 by J. H. Mottola, H. H. Hoffnagle and L. F. Sniffin, 49 Wall Street.

E. L. Post & Co, 50 Cliff Street, New York, metals, have increased their capital from $20,000 to $70,000.

The Industrial Machinery Corporation, New York, has been incorporated with a capital of $50,000 by E. C. Seward, 181 Devoe Street, Brooklyn; J. T. Hallinan, 184 Horton Street, Elmhurst, L. I., and J. T. Denton, Woodcliff-on-Hudson, to manufacture machinery, etc.

The Emergency Fleet Corporation, Washington, has taken over the plant of the Albany Boat Corporation, Albany, N. Y., for the manufacture of hydroplane hulls. It is said that the works will be quadrupled.

The Liberty High Speed Steel Corporation, Glens Falls, N. Y., has been incorporated with a capital of $10,000 by J. S. Cooper, W. Vile and A. Connor, Fort Ann, N. Y.

A two-story U-shaped brick and terra cotta addition, 75 x 122 ft., will be constructed at the works of the American Smelting & Refining Co., Perth Amboy, N. J. It is estimated to cost $75,000.

On April 11 the Oliver Loading Co., Runyon, N. J., com-

menced active operations at its new works, turning out a "mark 3 french fuse," said to be the first of its kind made in this country. The works include 15 buildings on a 100-acre site. R. L. Oliver is president, and A. V. Jensen superintendent.

The electric power plant of the New Jersey Zinc Co., Ogdensburg, N. J., was destroyed by fire April 10. It consisted of two boilers, engines, generators, auxiliary equipment. It will be rebuilt.

The Pennsylvania Railroad Co., has been granted permission to sell property near the Passaic River and Cape May Street, Harrison, N. J., to the Crucible Steel Co., which will build a hammer shop and annealing works to cost about $150,000.

The Henry R. Worthington Co., Harrison Avenue, Harrison, N. J., is reported considering the erection of an addition to its pump manufacturing plant.

G. E. Taylor, Rochester, N. Y., formerly connected with the Taylor Instrument companies of that city, is arranging for the establishment of a plant at Newark, for the manufacture of barometrical instruments for airplanes, etc. It is said that the plant will employ about 75 men at the start.

The Pyrophoric Metals Co., Newark, has been incorporated with a capital of $100,000 to operate a metal-refining plant. George W. Cunningham, Paterson; William Rea, Bloomfield; and William Bonnman, Passaic, are the incorporators.

A new one-story plant, 40 x 75 ft., to cost about $10,000 will be erected by the Natural Carbonic Gas Co., Newark, at its works on McClellan Street.

Baker & Co., Inc., 54 Austin Street, Newark, platinum refiner, has awarded contract for an addition.

The California Shel' Loading Co., New York, recently incorporated, has appointed Gilbert C. Higby, 207 Market Street, Newark, architect and engineer for its proposed shell-loading works at Old Bridge, near Perth Amboy, N. J.

The Marvel Process Co., Newark, has been incorporated with a capital of $125,000 by Walter E. Shettlemore, John Applebaum and I. E. Toddy, to manufacture heating appliances.

A new one-story boiler plant and engine house, 40 x 60 ft., will be erected by the Northern Feather Works & Produce Co., Backus Street and Avenue I, Newark.

The Barrett Co., 17 Battery Place, New York, operating plants at Philadelphia and elsewhere, is planning the construction of a new works near the plant of the Solvay Process Co., Solvay, N. Y.

McGill & Hulford, Binghamton, N. Y., have commenced the erection of a new machine shop, to be ready for operation early in June.

The Oneida National Chuck Co., 43 Cedar Street, Oneida, N. Y., manufacturer of machine chucks, has had plans prepared for two-story addition, 40 x 100 ft., to cost $11,000.

A power house to cost about $100,000 is to be built at Glens Falls, N. Y., by the Adirondack Power Co., Utica, N. Y. Later on it contemplates the construction of a power house in the vicinity of Schoharie.

Buffalo

BUFFALO, April 15.

The Buffalo Wash Tray Co., Buffalo, is preparing plans for a factory which it will erect at Grant Street and the New York Central Railroad.

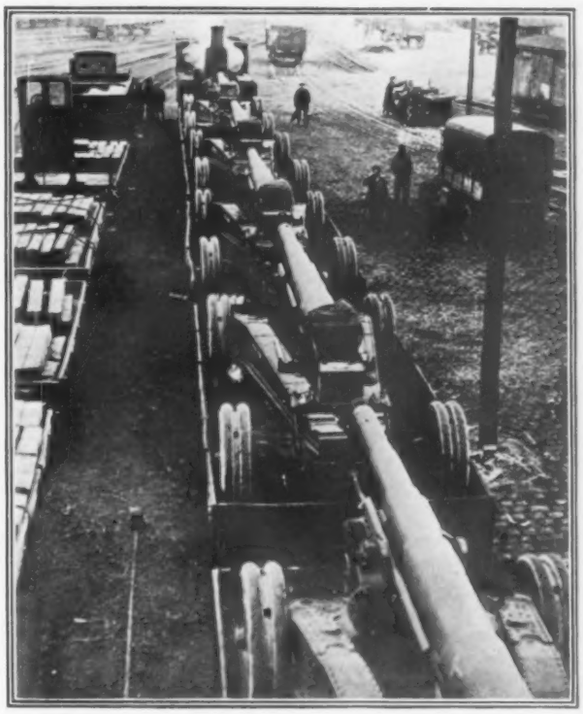
The Automatic Transportation Co., Buffalo, is preparing plans for annex factory No. 4, which it will erect at Main Street and the Erie Railroad.

Effective March 30 and continuing until April 1, the Curtiss Aeroplane & Motor Corporation shut down different departments, excepting those working on airplanes for the army and navy, to take an inventory of costs of aircraft now being manufactured for the Government under a cost-plus agreement.

The Buffalo Clam Shell Bucket Co., Buffalo, has been incorporated with a capital of $25,000 by W. L. Misner, 129 Erie Street, Buffalo, and W. H. Ahlers, 236 Maple Avenue, Hamburg.

The Comstock Parachute Airplane Co., Rochester, N. Y., has been incorporated with a capital of $100,000 by F. M. Comstock, 104 South Avenue; I. Hamilton, 251 Clinton Avenue, and H. V. Walker, 77 South Avenue.

The Wheeler-Greene Electric Co., 31 St. Paul Street, Rochester, manufacturer of electric motors, is considering the erection of additions for increased capacity. It recently increased its capital from $100,000 to $500,000.



These 155 Mm. Guns Loaded on Cars Which Left the Gare d'Orleans, Paris, on Feb. 18, Were Built by the French Government for Use of the American Army in France. Photograph copyrighted by Committee on Public Information

The Legal Level Light Co., Rochester, has been incorporated with a capital of $20,000 to manufacture automobile headlights, etc. D. T. Roach, I. Smith and T. B. Shanahan, Rochester, are the incorporators.

The Empire Axle Co., Dunkirk, N. Y., has been incorporated with a capital of $300,000 to manufacture axles, etc. E. D. Caldwell, Z. R. and O. F. Hakes, Dunkirk, are the incorporators.

The Smith Wheel Co., 101 North Geddes Street, Syracuse, manufacturer of automobile wheels, has acquired the Palmer-Moore plant, formerly the Syracuse Stove Works, directly opposite its factory, for a consideration said to be about $50,000. The property, 300 x 365 ft., is improved with a number of brick buildings, with total floor area of about 80 000 sq. ft., and will be used for an extension to the wheel works.

The Marion Hardware Co., Marion, N. Y., has been incorporated with a capital of $40,000 to manufacture hardware, agricultural implements, etc. C. H. Lookup and A. L. Dean, Marion, and C. R. Pratt, Williamson, are the incorporators.

The Waterville Foundry & Mfg. Co., Waterville, N. Y., has been incorporated with a capital of $25,000 by G. L. Hovey, C. W. and W. G. McLean, Waterville.

The Augustine Automatic Rotary Engine Co., Buffalo, has completed plans for an addition to its plant at Elmwood Avenue and the Erie Railroad.

The Donner Steel Co., Buffalo, has taken out permits for a group of additional buildings, including a brick and steel boiler shop to cost $21,000; two-story brick pyrometer building; two-story brick building for offices; brick locker room for the blowing mill, etc.

The Cattaraugus Cutlery Co., Little Valley, N. Y., is having plans prepared for three additional buildings, 60 x 100 ft., two stories, 60 x 40 ft., and 40 x 30 ft., to cost $60,000. Tinto Champlain is president.

The Ames Iron Works, Oswego, N. Y., has let contract for a brick and steel foundry building, 65 x 175 ft., one story, to cost $35,000.

The Oneida National Chuck Co., Oneida, N. Y., M. M. Reynolds, president, has completed plans for a factory extension, 40 x 100 ft., two stories, which it will erect this spring.

The General Electric Co., Schenectady, has let contract to the Austin Co., Cleveland, for a 300-ft. brick addition to one of its factory buildings.

The Transmission Ball Bearing Co., 1050 Military Road, Buffalo, will build a two-story reinforced-concrete addition, 175 x 350 ft., to cost $150,000.

The Stewart Motor Co., 9 Randall Street, Buffalo, is planning the construction of a one-story extension, 90 x 110 ft., on Mohican Street.

The Buffalo Contractors' Plant Corporation, 129 Erie Street, Buffalo, manufacturer of hoisting machinery, etc., has increased its capital from $250,000 to $550,000. It recently acquired property with factory building on Erie Street, to be equipped as an extension to its works.

A one-story machine shop will be erected and operated by M. J. McNiven, Buffalo, at Niagara Street and Bird Avenue.

The Morgan Machine Co., 1100 University Avenue, Rochester, manufacturer of box-making machinery, etc., has awarded a contract to the Austin Co., Cleveland, for the erection of a one-story machine shop, 75 x 100 ft., to cost $25,000.

The Atlas Crucible Steel Co., Howard Avenue, Dunkirk, N. Y., manufacturer of crucible tool steel, has awarded contracts for a machine shop at its works. A new rolling mill addition will also be constructed to increase present capacity.

The Dansville Iron & Metal Co., Dansville, N. Y., has been incorporated with a capital of $50,000 by A. Aronchick, P. and H. L. Lapides, Dansville.

The Delany Forge & Iron Co., 300 Perry Street, Buffalo, is making revisions in the plans for its proposed new machine shop and forge works. The buildings will be one-story, 100 x 250 ft. and 125 x 300 ft., respectively.

New England

BOSTON, APRIL 15.

While New England machine-tool builders and small tool plants are very busy, it is to be noted that most reports show a drop in the number of orders being received, although it is not so marked in respect to the number of inquiries. The machine-tool distributors have had, on the whole, a more quiet period than for several weeks past. One or two good inquiries are reported. The shipbuilding companies, notably the Groton Iron Works, have closed for some equipment.

The spread of business from both shipyards and munitions plants to all the small machine shops continues to promote a very lively buying movement from the smaller plants. Such purchases are usually for only one or two machines of a kind, but they constitute a very considerable portion of the business now being done.

The New England Castings Co., East Longmeadow, Mass., has been incorporated with authorized capital stock of $99,000. The directors are H. G. Meadows, president; Harold L. Stevens, Brookline, treasurer, and A. J. Skinner.

The Worthington Pump & Machinery Corporation, Blake & Knowles Works, Cambridge, Mass., as agent for the Government, is to erect on Rogers Street a one-story factory, 140 x 140 ft. The contract has been awarded.

The Mosstwin Co., Boston, has been incorporated with authorized capital stock of $150,000 to manufacture fasteners. Isidor Moss is president and Louis J. Stern, treasurer.

The New England Electric Lamp Co., Danvers, Mass., has been incorporated with authorized capital stock of $25,000. O. R. Bodwell is president and William A. Webb, treasurer.

The Ives Mfg. Corporation, Bridgeport, Conn., has increased its capital stock from $50,000 to $100,000.

The D. N. Clark Co., Shelton, Conn., has been incorporated with authorized capital stock of $100,000 to manufacture hardware. The incorporators are David N. Clark, Edward W. Kneen, and Dudley W. Stratton.

The Foster Machine Co., Westfield, Mass., is having plans drawn for a machine shop, two stories, 56 x 120 ft.

The Rostand Mfg. Co., Milford, Conn., has increased its capital stock from $25,000 to $100,000.

The Diamond Tack & Nail Works, Rockland, Mass., is to build an addition, 25 x 40 ft., one story, for storage.

The Ashcroft Mfg. Co., Bridgeport, Conn., has reduced its capital stock from $200,000 to $2,000.

The International Leather & Belting Co., New Haven, Conn., which sometime ago awarded a contract for the first unit of its new plant on Middletown Avenue, has awarded a contract for further construction. W. B. Covell is president and R. K. Hay is secretary-treasurer.

The Page Needle Co., Chicopee, Mass., has been incorporated with authorized capital stock of $300,000. The directors are W. S. Page, president; Irving H. Page, Chicopee Falls, treasurer; and C. O. Orne.

The Liberty Ordnance Co., Bridgeport, Conn., has awarded a contract for the erection of six new buildings, including an office, at a total cost of about $40,000.

The Reid Brothers Co., Beverly, Mass., has been incorporated with authorized capital stock of $20,000, to manufacture machinery and tools. Robert Reid is president and Andrew S. Reid, treasurer.

The Crane Co., Bridgeport, Conn., has secured a permit to erect an addition, 38 x 450 ft., one story, to its shipping room on South Avenue.

The F. W. Cheney Co., Manchester, Conn., maker of machines and tools, has been incorporated with capital stock of $33,000 by Charles Cheney, Horace B. Cheney and others.

The Bryant Electric Co., Bridgeport, Conn., is to build an additional story to a factory building 60 x 128 ft.

The Waterbury Clock Co., Waterbury, Conn., is asking bids on an addition, 60 x 85 ft., one story.

The Eastern Connecticut Power Co., R. W. Perkins treasurer, is expected to award contract for a power plant to be located at Browning Beach on the Thames River, near Norwich, Conn. The plant will represent an investment of nearly $1,000,000 and will be equipped with two 10,000-kw. generators, together with the necessary steam power equipment.

Philadelphia

PHILADELPHIA, April 15.

Government work is being seriously retarded by delays in the delivery of large tools, principally lathes for rough boring and turning guns. Some companies are months behind schedule.

Gun lathes which were about to be shipped to the Tacony Ordnance Corporation, Tacony, Pa., have been ordered shipped to the Ambridge, Pa., plant of the American Bridge Co., where the jackets for 9.5-in. field guns will be rough machined. Planers have also been diverted to the Ambridge plant.

The Bethlehem Steel Co., South Bethlehem, Pa., is in the market for eight large lathes, 42 to 54 in., for making shafts for submarine destroyers.

The American Steel & Forge Corporation, a subsidiary of the Westinghouse interests, will make shafts for turbines, and a representative of the company has been at a hotel in Philadelphia during the past week arranging for the necessary equipment.

The C. H. Wheeler Mfg. Co., Philadelphia, has bought about 20 new tools for making condensers for submarine destroyers.

The Du Pont Engineering Co., Wilmington, Del., has bought additional machine-tool equipment for the Government powder plant it is building at Nashville, Tenn., the War Department having ordered the size of the plant practically doubled. It capacity will be 900,000 lb. of smokeless powder per day instead of 500,000 lb., as at first planned.

A purchasing officer from the Aberdeen Proving Ground, Aberdeen, Md., has placed orders in Philadelphia for machine-shop equipment. Machine-shop equipment has also been bought here for ordnance bases which will be constructed on the Raritan River, near Newark, N. J.; on Curtis Bay, near Baltimore, Md., and at Pig Point, Va., near Norfolk.

The Pennsylvania Railroad Co., Philadelphia, has purchased through its subsidiary, the Manor Real Estate & Trust Co., the plant at Twenty-first Street and Glenwood Avenue, for about $85,000, and will use it for additional repair works capacity.

A one-story boiler plant, to cost about $20,000, will be erected by the Louis Walther Mfg. Co., Philadelphia, at its works at Torresdale Avenue and N Street.

In connection with its new one-story machine shop to be erected at Bridesburg, Charles Lennig & Co., 112 South Front Street, Philadelphia, will also build a one-story forge shop, 27 x 55 ft.

Alfred Box & Co., Front and Poplar streets, Philadelphia, manufacturers of hoisting machinery, traveling cranes, etc., have been incorporated in Delaware with a capital of $150,000.

The Bureau of Yards and Docks, Navy Department, Washington, is building a one-story addition to its fuse shop at the Frankford Arsenal, Philadelphia, to cost about $30,000.

The Philadelphia Electric Co., Philadelphia, and the Electric Bond & Share Co., 71 Broadway, New York, are planning extensions to their electric power stations at Harwood and other sections in the mining district for increased capacity. It is proposed to add an output of about 100,000 hp. to these plants and construct three new ones of 100,000 hp. The Government is interested in the project which is designed primarily to reduce fuel transportation.

In connection with its new plant George W. Smith & Co.,

Inc., 3907 Powelton Avenue, Philadelphia, will build a two-story brick boiler plant, 50 x 88 ft., to cost $35,000.

The J. L. Mott Iron Co., Hancock Avenue, Trenton, N. J., manufacturer of water and steam fittings, etc., has organized the Mott Co. of California, with capital of $50,000 to operate as a subsidiary manufacturing organization. Robert K. and William J. J. Bowman, and William F. Bantje, Trenton, are the incorporators.

The John E. Thropp's Sons Co., Lewis Street, Trenton, N. J., manufacturer of tire-making molds and machinery, is planning the erection of a new foundry, 100 x 360 ft., at the foot of Mill Street.

The Shaw Pottery Co., Trenton, N. J., recently organized, has taken over the former plant of the Morris China Co., Parker Avenue, and will establish a plant for the manufacture of pottery, etc. James Shaw, formerly secretary of the Cannonsburg Pottery Co., Cannonsburg, Pa., heads the new organization.

The New Standard Projectile Boring Machine Co., Camden, N. J., has been incorporated with a capital of $100,000 to manufacture projectile-boring machinery. Samuel S. and W. W. Williamson, Philadelphia; and Edward L. Parker, Longport, N. J., are the incorporators.

The Columbia Malleable Castings Co., Columbia, Pa., is planning the construction of a two-story addition to cost about $10,000.

The Glass Casket Co., Altoona, Pa., is taking bids for a one and two-story plant, 120 x 200 ft., and 100 x 150 ft., to cost over $400,000. C. O. Manning, Central Trust Building, is engineer.

The plant of the John Wood Mfg. Co., Conshohocken, Pa., which has been working on Government orders, has been taken over by the Government for operation, effective April 11.

An electric power plant will be constructed by the Bureau of Yards and Docks, Navy Department, Washington, at the new Government buildings to be located at Cape May, N. J. A pump house and other structures will also be erected.

Fire, April 9, partly destroyed the machine shop of the Delanco Steel Shipyard, Delanco, N. J., subsidiary of the Chester Shipbuilding Co., Chester, Pa., with loss of about $10,000.

The Standard Metallic Products Co., Paulsboro, N. J., has closed its works temporarily owing to inability to obtain materials for manufacturing metallic specialties for war service.

Baltimore

BALTIMORE, April 15.

The Lang Products Co., 111 North Charles Street, Baltimore, has been incorporated by George R. Gaither, Charles H. Quigley and Thomas R. Bond, to manufacture machinery, etc.

The F. X. Ganther Co., Sharp and Ostend streets, Baltimore, manufacturer of showcases, etc., will build two three-story factory buildings, 70 x 200 ft. and 65 x 123 ft., at Leadenhall and West streets, at a cost of $32,450.

The General Industries, Inc., Wilmington, Del., an organization which includes the du Pont Powder Co. and affiliated companies, has filed notice of increase in capital from $25,000,000 to $50,000,000, with change of name to the du Pont American Industries, Inc.

I. Blaine White and F. Brooke Whiting, Cumberland, Md., are organizing a company to operate the plant of the old Eastern Glass Works, South Cumberland, recently acquired. It is proposed to remodel and equip the plant for the manufacture of high-grade glassware. It is expected to have the works in operation in about three months, giving employment to about 100 men.

The Carolina Aircraft Co., Raleigh, N. C., recently incorporated with a capital of $500,000, is planning the erection of a plant. Howard White is president.

The Emergency Fleet Corporation, Washington, is planning the construction of a shipbuilding plant at Wilmington, N. C., for the building of concrete-steel vessels.

The National Pyrites & Copper Co., Birmingham, Ala., has increased its capital from $30,000 to $60,000.

The Alabama Dry Dock & Shipbuilding Co., Mobile, Ala., is planning extensions to increase present capacity. It recently increased its capital from $500,000 to $600,000.

The American Locomotive Co., Richmond, Va., has recently purchased a local factory building and site and is planning to equip it for the production of machine parts.

Pittsburgh

PITTSBURGH, APRIL 15.

Little interest is shown in the local machinery market, orders placed for iron-working tools and special equipment being largely of a routine nature. Large buyers of machine tools have their wants pretty fully covered for the present but occasionally buy a tool or two. The demand for cranes is more active than for machine tools and prices are considerably lower than a year or so ago. Much quicker deliveries can now be had on cranes and small machine tools, but on heavy tools manufacturers seem to be sold as far ahead as ever and deliveries are very slow.

The shortage of labor in foundries and machine shops in this district is very acute, and is keeping down production considerably.

Some fairly large inquiries have recently come from the Tennessee Coal, Iron & Railroad Co. for equipment for the new shipyards it is establishing at Mobile, Ala. One inquiry is for 15 cranes, ranging from 5 to 75 tons capacity. The Tennessee company is building large plate mills at Fairfield, Ala., and proposes also to establish a steel foundry and a car plant. If these plans go through it will be a very heavy buyer of machine tools, but as yet no definite inquiries are out.

The Pennsylvania Railroad has under way plans for material enlargements to its Juniata shops at Hollidaysburg, Pa., which will probably involve the purchase of many machine tools. The Pennsylvania Lines West also have plans for enlargements of its shops at several different places, but no definite decision has been reached. It is still buying a fair amount of tools for its new shops at Columbus, Ohio, but the greater part of these requirements has been filled.

The Sharon Steel Hoop Co. has an inquiry out for a 15-ton electric crane for its finishing mills at Lowellville, Ohio.

The Louisville & Nashville Railroad has an inquiry out for a 200-ton crane for its shops at South Louisville, Ky.

The Keystone Bronze Co., Pittsburgh, has placed a contract with the Lawrence Steel Products Co. for an addition to its brass foundry, 86 x 148 ft.

The Peerless Foundry Co., Pittsburgh, has bought an 8-acre site at Latrobe, Pa., and will build a foundry and machine shop, 80 x 275 ft., work on which will start at once. It will manufacture primarily coal and gas hot water and steam boilers, and will also do a general jobbing, foundry and machine business.

The Triple Airless Tire Co., Kittanning, Pa., is planning for the construction of a new one-story plant, 150 x 150 ft., with power plant, to cost about $85,000. Headquarters of the company are in the Jenkins Arcade Building, Pittsburgh.

The Pittsburgh Rolls Corporation, Pittsburgh, has filed plans for the construction of a one-story foundry, 50 x 75 ft., on Forty-first Street.

C. A. Schroder, Pittsburgh, has taken out a building permit for a machine shop on Tioga Street.

The Kelly Brothers Mfg. Co., Belington, W. Va., has been incorporated with a capital of $50,000 to manufacture castings. The company proposes to operate a local foundry and machine shop. J. F. Kelly, Elkins, Md.; J. A. and H. V. Vilquesney, Belington, are the incorporators.

Chicago

CHICAGO, April 13.

The local trade has enjoyed a good week, despite what appeared to be a slowing up of demand a few days ago. No lists of large size have appeared, but several small ones have been issued by makers of tractors and auto trucks, several of whom have placed orders for individual machines and have inquiries out for others. Rock Island, Davenport and Moline are active centers of demand, while prospective buyers to the north and south of Chicago are noted. The Naval Training Station at the Great Lakes has placed orders for a number of small lathes, shaping machines and small tools needed for instruction purposes. The Chicago, Burlington & Quincy list, a big proposition, is still pending.

It is reported that the Chicago Marine Corporation is being organized with a capital stock of $1,500,000 to $2,000,000, to build ships in Chicago. Lee Giblin, western manager of the Foundation Co., is mentioned as active in the enterprise. Plans provide for 10 ways for the construction of vessels of 3500 dead weight tonnage, designed for use in the coastwise trade. A site has not yet been selected.

The Liberty Car & Equipment Co. has purchased the plant and machinery of the Central Locomotive & Car Works, Chicago Heights, Ill., and will manufacture and repair

freight cars. The deal includes 33 acres of land for which $100,000 was paid, and machinery and equipment at $250,000. The company is a new one with a capital stock of $750,000.

The B. J. Regnell Co., 19 South La Salle Street, Chicago, has been awarded the general contract for a one-story factory, 125 x 125 ft., to be occupied by W. J. Dennis & Co., manufacturers of hardware specialties, 2110 to 2120 West Lake Street, Chicago. It is to cost about $25,000.

A portion of the plant of the Standard Steel Car Co., Hammond, Ind., was destroyed by fire April 6, the loss being estimated at $750,000. Fifteen cars completed for troop transportation were destroyed, but the firemen saved an adjoining shop wherein gun mounts are made. The workmen were parading in Hammond at the time, and the cause of the fire is being carefully investigated.

The Interstate Iron & Steel Co., Seventy-eighth Street and South Chicago Avenue, Chicago, has filed plans for the erection of a one-story extension to cost about $9,000.

The International Harvester Co., South Michigan Avenue, Chicago, is having plans prepared for a series of one-story foundry buildings on Rockwell Street, estimated to cost over $500,000.

Armour & Co., Union Stock Yards, Chicago, have filed plans for the erection of a new one-story machine shop, 110 x 180 ft., to cost $40,000.

The Universal Concrete Casket Co., Chicago, has been incorporated in Delaware with a capital of $2,000,000. Edward A. Biggs, Solomon Lettvin and W. W. Hall, all of Chicago, are the incorporators.

The Viking Pump Co., Cedar Rapids, Iowa, manufacturer of pumping machinery, is planning for the erection of an addition to its plant, 36 x 125 ft., to cost $20,000.

A one-story machine shop to cost about $10,000 will be erected by G. Schmeltz, 107 South Second Street, Marshalltown, Iowa.

The Gulf States Portland Cement Co., Mason City, Iowa, has been incorporated in Delaware with a capital of $2,000,000 to manufacture cement, etc. W. M. Briar and R. A. Law, Mason City, and R. C. Lubens, St. Ansgar, Iowa, are the incorporators.

Milwaukee

MILWAUKEE, April 15.

The demand for milling machines continues heavy and has resulted in slightly lengthening the time of delivery on some types. On standard sizes local makers are quoting from three to five months ahead. A temporary slackening is noted in the demand for lathes and some other lines of machine-shop equipment, but this has not afforded any relief from the high pressure conditions and plant capacity is well occupied until after July 1.

Many municipalities are contracting for the erection and equipment of additions and improvements to hydroelectric and steam generating plants. Much of this work was projected a year ago but deferred because of the congested conditions in the machinery market following the declaration of war. Contracts placed are now subject to delivery and the work is proceeding.

The Wisconsin Gear & Axle Co., Plankinton Arcade Building, Milwaukee, a new interest organized recently to manufacture units and parts for automobiles, trucks and tractors, has broken ground for the first unit of its plant at State Street and Hawley Road, town of Wauwatosa. The first shop will be 50 x 150 ft., one-story, of reinforced concrete and brick, and cost $25,000. It is to be ready about June 1.

The Standard Crucible Steel Casting Co., 719 Thirtieth Street, Milwaukee, is erecting a reinforced concrete and brick shop addition, 40 x 45 ft. The needed equipment has been purchased. George F. Birkel is secretary.

The Rosenthal Corn Husker Co., West Allis, manufacturer of harvesting machinery, sustained nearly the total loss of its frame foundry and equipment by fire on April 9. The building was 30 x 100 ft., and will have to be replaced, together with the equipment.

C. W. Hathway, Waukesha, Wis., has disposed of one-third interest in his machine-shop business to Frank Perkins and Henry Stock, practical machinists. The manufacture of special machinery and general repair work will be continued.

The Simmons Co., Kenosha, Wis., manufacturer of seamless steel beds and springs, has awarded a contract to the Wells Brothers Co., 53 West Jackson Boulevard, Chicago, for the erection of a new administration and laboratory building, costing about $100,000, on the percentage basis. The architect is Max Dunning, 304 South Wabash Avenue, Chicago. Joseph Ferris is general superintendent.

The Two Rivers Plating Works, Two Rivers, Wis., has awarded contracts for the erection of a one-story brick and steel addition, 60 x 75 ft., to cost, with equipment, $18,000.

The C. Ansted Leather Co., 560 Commerce Street, Milwaukee, will install an additional 150 kw. steam generating unit and 16 electric motors of an aggregate of 165 hp., at a cost of $10,000.

Joint District No. 4, Metomen, Fond du Lac County, Wis., has voted to build a new high school, with manual training facilities, at a cost not to exceed $35,000, in the village of Fairwater. B. E. Mehner, Fond du Lac, is the architect. H. H. Board is principal.

The LaPointe Foundry Co., Schlesingerville, Wis., has increased its working force to 75 and is now operating day and night shifts. The company has requested local business men to provide a railroad siding to the foundry at an estimated cost of $1,000.

The Milwaukee Paper Box Co., 400 Florida Street, Milwaukee, will build a five-story manufacturing building, 120 x 145 ft., of reinforced concrete, brick and steel, on a new site at South Pierce Street and Muskego Avenue, at an estimated cost of $200,000, including machinery, motor and other equipment. William C. Carlson is president and treasurer. Plans have been completed by Schnetzky & Son, architects, 712 Germania Building, who are now taking bids.

The Terrio Mfg. Co., Waupaca, Wis., manufacturer of steel dental burrs and other supplies, has completed a battery of automatic machines of its own design and production which enables it to enlarge its output and manufacture the product from the steel bar.

The electric light and water commission, Brodhead, Wis., is calling for sealed bids until April 30 for improvements in the hydroelectric generating plant costing $35,000, including installation of a new water power unit, with all appurtenances.

The Menominee Motor Truck Co., Menominee, Mich., has moved to new quarters on Broadway, where floor space is available for doubling its production. The building is three stories and contains a machine-shop, smithy, assembling floor, body, paint and trimming shop, etc.

The Gillette Rubber Co., Eau Claire, Wis., has awarded contracts for the erection of a two-story brick and steel addition, 64 x 140 ft., costing about $30,000.

C. A. Hanan, village clerk, Oregon, Dane County, Wis., is taking bids for a 175-gal. centrifugal pump and an auxiliary suction pump, with a 220-volt motor, starter, etc.

The industrial school board, Appleton, Wis., C. D. Thompson, secretary, is taking bids until April 22 for the construction of the first unit of the proposed new $200,000 vocational training institute, 100 x 100 ft., three stories and basement. It will contain a full manual training equipment

The New Way Mfg. Co., Eau Claire, Wis., manufacturer of concrete mixers and steel barn equipment, has completed its new plant and is now engaged in regular production.

The United States Auto Gear Shift Co., Eau Claire, Wis., has awarded the general contract to Hoeppner & Bartlett for the erection of a four-story factory building, 80 x 100 ft., to contain an aluminum and brass foundry, machine-shop, assembling room, etc. Edward Hutchens, 866 Superior Street, Milwaukee, is architect and supervising engineer.

Detroit

DETROIT, April 15.

Detroit employers have found it necessary to send a man to Washington to bring before the attention of officials the serious local shortage of skilled labor. More than 20,000 skilled workmen are now desired, and this number will be increased to 33,000 within six weeks. Manufacturing business in the iron, steel, copper and brass lines grows more active. A larger proportion of the city's output is for the Government. Automobile plants have reduced the production of cars 20 to 70 per cent and are devoting their equipment to war work. Little change is recorded in the machinery market, which is normally active. Few inquiries for large orders have come in, but the total is good.

The Doble-Detroit Steam Motor Co., Detroit, maker of the steam automobiles, has purchased the General Engineering Co., former holder of the Doble patents, covering the application of steam power to automobiles. The Doble-Detroit company will issue $1,500,000 of its stock to five voting trustees, who will issue one stock certificate for the same amount to the General Engineering Co. Nine of the fifteen directors of the Doble-Detroit Co. who have been elected are: President, Morgan J. Hammers; vice-president and secretary, Claude L. Lewis; vice-presidents, Abner Doble and Kirk B. Alexander; treasurer, Harrington E. Walker; Harold C. Johnson,

A. B. Frenier, William J. Fisher and F. R. Humpage. The existing vacancies will soon be filled.

The Automotive Mfg. Co., Detroit, has opened general offices at 1316 Dime Bank Building. It occupies the plant at Grand River and Loraine avenues and will manufacture automobile parts, including Anco universal joints and pressed steel parts. I. D. Shaw, former manager of the Cincinnati Ball Crank Co.'s Detroit office, is president.

The Four Wheel Drive Truck Co., Webberville, Mich., organized about six months ago with a capitalization of $50,000, has completed its plant and the manufacture of the first 2-ton truck is under way. The officers of the company are as follows: President and assistant secretary, Ashmon Catlin; secretary and manager, Frank Young; vice-president, F. D. Welfare; treasurer, W. W. Thorburn.

The Wolverine Tractor Co., Detroit, is to be established in Saginaw, Mich. W. E. Wood, Detroit, builder of the General Motors' plants and other large structures, is back of the company. It will be located on a part of the tract of land recently purchased by the local board of trade. Plans call for a building, 100 x 250 ft., one story, of saw-tooth roof construction.

Cleveland

CLEVELAND, APRIL 15.

The demand for cranes for shipyards and Government work is heavy, and some large new inquiries have developed for ore and coal handling equipment. The Brown Hoisting Machinery Co., Cleveland, has taken a large order for 10 and 15-ton portal pier and locomotive cranes for the French Government. The American International Shipbuilding Corporation has placed an order with the McMyler-Interstate Co., Bedford, Ohio, for considerable crane equipment for the Hog Island shipyard, which includes about 24 10-ton and 4 35-ton locomotive gantry cranes.

A lull has appeared in the machine tool market. There is still a steady demand for single tools from scattered sources, but no round lot buying was reported the past week, and there are few new inquiries of any size.

The Ohio Electric & Controller Co., 5900 Maurice Avenue, Cleveland, recently incorporated with a capital stock of $200,000, has completed its organization and elected F. W. Jessop, formerly works manager of the Electric Controller Mfg. Co., Cleveland, president; W. B. Greene, vice-president, and A. D. Walters, secretary and treasurer. The company will at once begin the manufacture of lifting magnets, and later will bring out a line of controlling devices.

The Automobile Screw Products Co., Oregon Avenue, Cleveland, has acquired a site on East 152nd Street, on which it will at once begin the erection of a new plant, 90 x 120 ft. About 15 automatic machines and some toolroom equipment will be installed in addition to the machinery it already has. Orders have been placed. C. W. Blossom is president, and J. P. Blossom, general manager.

The board of education, Lakewood, Ohio, will receive bids April 30 for machinery equipment for its new manual training department, which includes a 14-in engine lathe, extension gap lathe, milling machine, planer, 14-in. shaper, 24-in. shaper, radial drill, universal tool and cutter grinder, 16-in. drill press, sensitive drilling machine, power saw, wet tool grinder, motor-driven grinder, portable crane, milling machine, air compressor and horizontal boring mill. In the case of a number of the machines the board asks for prices on one or more of the various items listed.

The U. S. Metal Goods Co., 5205 Euclid Avenue, Cleveland, is installing a machine shop, and has an inquiry out for light machinery equipment including five drill presses, milling machine, grinder, three turret lathes, three punch presses, and other small tools.

The Cleveland Wrought Products Co., Cleveland, will enlarge its plant by the erection of a factory, 60 x 100 ft.

The Upson Nut Co., Cleveland, will erect a two-story warehouse, 52 x 200 ft., and has placed contract with the Crowell-Lundoff-Little Co.

The Vim Motor Co., Sandusky, Ohio, has acquired control of the Sandusky Forge Co., by purchasing $150,000 of the common stock, and has taken possession of its plant. The Vim company has increased its capital stock from $60,000 to $400,000, and has reorganized and elected William Hendrickson, president; A. R. Walton, vice-president and general manager; Frank B. Adams, treasurer, and William J. Beutel, secretary. The company has taken Government contracts for steel hubs for artillery wheels, and for adapters for shells. Orders for a round lot of automatic screw machines and other machine tools have been placed.

Charles A. Longsdorf, Mansfield, Ohio, has purchased the sheet metal and roofing business of C. E. Martin & Brother, in that city, which will be conducted hereafter under the name of the Mansfield Sheet Metal Products Co. The product includes tanks of various types.

The Shelby Tractor & Truck Co., Shelby, Ohio, has taken a Government order for 150,000 4.7-in. shells. The company will purchase about $20,000 worth of additional machinery, and plans shortly to begin the erection of an extension, 60 x 200 ft.

The Manufacturers' Supply Co., Lima, Ohio, has been incorporated with a capital stock of $35,000, and will succeed to the business heretofore conducted by the Good Tool & Supply Co. J. A. Carpenter is president, F. A. Thomas, vice-president and treasurer, and C. R. Carpenter, secretary.

The Kauffman Metal Parts Co., Bellefontaine, Ohio, is planning the erection of a new plant.

The Union Metal Co., Canton, Ohio, will increase its capacity by the addition of new equipment, and plans to build an addition later. It has increased its capital stock from $75,000 to $400,000.

The Maunee Iron & Steel Co., Toledo, Ohio, has been incorporated with a capital stock of $50,000 by George W. Ritter and others.

The Tower Textile Mills Corporation, Toledo, has commenced the erection of a plant on the site of the old Shelby Tube works on Dorr Street. The first building will be 80 x 300 ft.

The Riggs Rotary Motor Co., Wheeling, W. Va., has been organized to build a new type of motor for airplane, automobile and other uses. Louis W. Riggs is president; T. R. Young, secretary; Thomas Baird, treasurer, and J. R. Hughes, general manager.

Cincinnati

CINCINNATI, April 15.

The Government recently placed an order for four boring and turning lathes with a nearby maker which will probably be the largest machines of their kind ever constructed. Specifications call for lathe beds 240 ft. long. Preliminary work has begun on their manufacture. Considerable other Government business is drifting in, but no large lists are out. Some heavy orders have recently been received for portable electric drilling machines for export, most of these to be shipped to Italy.

The George B. Curd Co., Cincinnati, has acquired the ice machinery plant of the F. W. Niebling Co., Norwood, which will be equipped for repairing locomotives and cars. It will also manufacture mining cars and later on portable air compressors and other contractors' equipment. George B. Curd is president of the company, which will be incorporated at an early date.

T. H. Taylor, Cincinnati, is forming a company for manufacturing corrugated paper goods. A factory building has been leased at 416 East Eighth Street.

The Fewlass-Leen Brass & Iron Co., 610 East Front Street, Cincinnati, has acquired a plant at Pike Street and Friendship Alley, which will enable it to increase its output.

G. F. Wieser, Columbus, Ohio, has established an oxy-acetylene welding plant at 783 North Fourth Street.

The new stove foundry of the A. T. Nye & Son Co., Columbus, is expected to be in full operation before May 1. The company was formerly located at Marietta, Ohio.

The Columbus Metal Co., Columbus, recently incorporated with $30,000 capital stock, is equipping a gray iron foundry at 459 Parsons Avenue.

The Ironton Incandescent Light & Supply Co., Ironton, Ohio, will build an addition to its plant at First and Chestnut streets.

The plant of the Hobart Brothers Co., Troy, Ohio, manufacturer of motors and motor generating sets, was recently damaged by fire, causing an estimated loss of $25,000. Rebuilding plans are under way.

The Germania Supply & Foundry Co., Covington, Ky., a Cincinnati suburb, has changed its name to the Martin Foundry Co. No additions are contemplated at the moment.

The Mosler Safe Co., Hamilton, Ohio, is contemplating building an addition to its plant at an early date.

The Black & Clawson Co., Hamilton, builder of paper-making machinery, will reconstruct its foundry at an early date. This was made necessary by the plans of the Miami Conservancy District Board, which require the removal of part of the foundry building.

The F. K. Vaughn Building Co., Hamilton, has been awarded contract for the proposed shop and foundry of the Bentel & Margedant Co., Hamilton.

The Niles Tool Works Co., Hamilton, contemplates the construction of an office building. The present space used for offices in the main plant will be utilized for manufacturing purposes. Approximately 1400 men are now employed.

The National Stove Repair Co., Dayton, Ohio, has been incorporated with $20,000 capital stock by Joseph Kramer and others and will establish a foundry.

The Trailmobile Co., Cincinnati, has been organized to take over the carriage building plant of Sechler & Co., on East Sixth Street. The company has a large Government contract for kitchen trailers and is installing additional equipment.

The M. Weber Co., Dayton, Ohio, maker of automobile tops, will erect an addition to its plant, 75 x 100 ft., four stories, of concrete and steel.

Indianapolis

INDIANAPOLIS, April 15.

The Schroeder Headlight & Generator Co., Evansville, Ind., has increased its capital stock from $150,000 to $250,000 and has taken over the L. B. Jones Co., Kansas City, Mo., manufacturer of farm electric plants.

Fire destroyed the plant of the Malherbe-Basile Clay Products Co., Vincennes, Ind., April 6, causing a loss of $100,000.

The Empire Brass Foundry, Richmond, Ind., has been incorporated with $10,000 capital to manufacture metal products. The directors are Albert C. Hurrel, James E. Jones and Joseph H. Hill.

The Hercules Gas Engine Co., Evansville, Ind., is taking bids for the erection of a one-story extension to its plant, 175 x 450 ft., to cost about $150,000.

The Central South

LOUISVILLE, April 15.

The C. Lee Cook Mfg. Co., Louisville, manufacturer of metallic packing, has taken out a permit for an addition to cost $20,000. The company reports that it will reassemble machinery, and will need comparatively little new equipment.

The Guyan Machine Works, Logan, W. Va., is in the market for a 30 or 40 hp. single drum electric hoist, 220 volt, three phase, 60 cycle, complete with controller. It also wants dealers' prices on 40 to 100-hp. locomotive type boilers, including stacks, grates, fittings, etc., 100 to 125 lb. pressure.

The Mutual Motors Co., Little Rock, Ark., plans the installation of a complete machine shop, and requires a lathe with 8 to 12-in. swing; 20-in. back geared drill press, electrical equipment, air compressor, portable crane, small tools, etc.

The John G. Duncan Co., Knoxville, Tenn., is in market for a new or second-hand revolving tractor shovel.

The Norfolk & Western Railroad Co., J. E. Crawford, chief engineer, Roanoke, Va., will rebuild its machine shop recently burned at Wilcoe, W. Va.

The Engine Specialty Co., Jacksonville, Fla., has been incorporated with capital of $50,000 to manufacture engine specialties. R. F. Ensley is president.

The Eufaula Farm Products Co., Eufaula, Ala., is in the market for a 150 hp. boiler.

S. A. Neville, Meridan, Tenn., has organized a company to establish a local plant for the manufacture of freight cars. The proposed works will cost about $150,000.

The Estate of R. G. Holzer, manufacturer of architectural sheet-metal work, etc., 317 Burgundy Street, New Orleans, La., is in the market for a spot welder and for a machine to form 1-in. to 3-in. angle iron, ⅛ in. to ⅝ in. thick, into rings 5 in. to 48 in. in diameter. J. E. V. Holzer is in charge of purchasing.

St. Louis

ST. LOUIS, April 15.

The Ozark Coal & Mining Co., Ozark, Mo., M. V. Waterfield secretary, is in the market for coal mining and power plant equipment and will receive bids until May 1.

The Harrison Gas & Electric Co., Harrison, Ark., has reorganized with R. M. Fellows as president and is in the market for additional mechanical equipment.

The Green Light & Power Co., Pleasant Hill, Mo., has acquired the electric light plant at Garden City, Mo., and is in the market for some new equipment.

Ryan, Mo., is in the market for crude oil engines and machinery for its electric light and waterworks plant.

Stillwater, Okla., H. A. Pressey, Oklahoma City, engineer in charge, will expend about $30,000 on new electric light and power plant equipment.

The Davidson Mill & Elevator Co., Muskogee, Okla., will expend about $10,000 on new equipment to replace that destroyed by fire.

The Oklahoma Gulf Corporation, M. L. Rogers, L. A. Irwin and M. L. Gatchell, Wilmington, Del., incorporators, will utilize $2,000,000 of capital in establishing refineries and pipe lines in Oklahoma.

The Oklahoma-Texas Oil & Refining Co., with a capital of $3,000,000, has been incorporated by F. D. Buck, Newcastle, Del.; M. L. Horty and K. E. Longfield, Wilmington, Del., to establish refineries and pipe lines in Oklahoma.

The C. S. C. Oil & Refining Co., Duncan, Okla., has been incorporated with a capital stock of $1,500,000 by J. L. Thompson and Thomas Rowland, Healdton, Okla., and will equip an oil refining plant.

The American Packing Co., St. Louis, will erect a cold storage plant and require about $7,000 worth of machinery.

The Ringling Oil Refining Co., Ringling, Okla., $200,000 capital, has acquired a 10-acre site and will proceed at once with the equipment of a refinery.

J. B. White, Kansas City, Mo.; the Forest Lumber Co., Oakdale, La.; Louisiana Central Lumber Co., Clarks, La., and the Louisiana Long Leaf Lumber Co., Fisher, La., have acquired 102,000 acres of timber land and will build mills, railroads, etc., for its development.

Ardmore, Okla., J. H. Curlock, city engineer, is in the market for about $15,000 worth of garbage incineration equipment.

The Lamb-Fish Lumber Co., Charleston, Miss., is in the market for equipment for a plant to extract denatured alcohol and acetone from mill waste. A plant to cost about $1,000,000 will be built.

The Missouri Pacific Railroad Co., E. A. Hadley, chief engineer, St. Louis, will equip a 10-stall roundhouse and machine shop at Lake Charles, La.

The Vocational School, New Orleans, La., J. A. Pratt president, will equip a school for training men in shipbuilding, repairing, etc., and will install equipment at a cost of about $300,000, in a foundry, machine-shop, electrical plant, etc.

The Mutual Motors Co., Southern Trust Building, Little Rock, Ark., is in the market for portable cranes, cylinders grinders, drill press, swing lathe, arbor press, and other equipment.

The Economy Kerosene Radiator Co., Savannah, Mo., has been incorporated in Delaware with a capital of $100,000 to manufacture radiators, etc. Jonathan H. and N. B. Rea, Savannah, are the incorporators.

The Sherman Iron Works Corporation, Baxter Springs, Kan., is planning for the construction of two one-story machine shops to cost about $20,000.

The Powell-Mahon Co., Tulsa, Okla., is building a new machine shop and foundry. It will give employment to about 50 men for initial operations.

The Concrete Ship & Barge Corporation, Biloxi, Miss., is planning for the construction of a plant to build concrete-steel vesesls. L. C. Howard is manager.

California

LOS ANGELES, April 9.

The Pacific Electric Railway Co., Sixth and Main streets, Los Angeles, is taking bids for the construction of its railroad shops at Torrance, consisting of 14 reinforced-concrete and brick buildings, estimated to cost $1,000,000. They will include machine shops, 180 x 450 ft.; forge shop, 150 x 200 ft.; freight car shop, 180 x 400 ft.; erecting shops, 180 x 450 ft.; paint shop, 180 x 450 ft., etc. A one-story power house, 60 x 120 ft., will also be erected.

The board of education, Los Angeles, is preparing plans for a one-story machine shop, 70 x 100 ft., at the San Pedro High School.

The Pacific Coast Tractor Co., Los Angeles, has been incorporated with a capital of $50,000 by R. D. and E. D. Humphrey and J. A. Knudson to manufacture tractors.

William Gregory & Sons, Los Angeles, have filed notice of organization to carry on a machinery business. William Gregory, 1821 South Gramercy Place, and W. S. Gregory, 1228 West Twenty-fourth Street, head the company.

The Ferro Concrete Shipbuilding Corporation, Los Angeles, recently organized, has closed negotiations with the cities of Redondo and Hermosa Beach for the construction

of a shipbuilding plant on property at Hermosa Beach. It has established temporary offices at the city engineer's office, Redondo Beach, in charge of K. Q. Casebolt.

The Southwestern Shipbuilding Co., Los Angeles, recently incorporated, is planning the construction of its plant on Terminal Island, San Pedro Harbor. Arthur C. Hurt and E. A. Mills, Los Angeles, are the incorporators.

In connection with the new naval flying station to be established on North Island, San Diego, Cal., by the Bureau of Yards and Docks, a one-story machine shop, a woodworking shop, as well as other repair and assembling buildings, will be constructed. It is also planned to establish a school building for the practical instruction of mechanics. Plans for the new station and works have been approved and preliminary construction work has been inaugurated.

The Townsend Tractor Corporation, Los Angeles, has been incorporated with a capital of $100,000 to manufacture tractors. E. F. Townsend, McCullough Graydon, Los Angeles; and Walter L. Bowers, Casa Verdugo, are the incorporators.

The Steam Point Mfg. Co., Los Angeles, has been incorporated with a capital of $25,000 by Glenn Knight, Walker Garrett and James W. Lombard to manufacture steam specialties.

A 40-ton cotton gin to cost about $50,000 will be constructed by the Somerton Cotton & Commercial Co., Yuma, Ariz. It has also commenced the erection of a cotton gin at Somerton to cost $25,000.

The Newport Shipbuilding Corporation, Ltd., Los Angeles, has been incorporated with a capital of $1,000 000. A lease has been taken on a site of 12 acres at Newport Beach, near Los Angeles, for a shipyard for steel-concrete vessels. Lloyd H. Coffman, R. W. Jamison, G. G. Doll and Gail Wehrle are the incorporators.

S. E. Cressey, San Pedro, Los Angeles, has taken out a permit to build a machine shop, 30 x 60 ft., on the east side of the Mormon Island Channel.

The Home Gas Generator Co., Los Angeles, has been organized to manufacture gas generating plants for home service. T. D. Heyl, 5215 South Figueroa Street, and J. L. Brown, 895 North Los Robles Avenue, Pasadena, head the company.

The Terminal Ways & Machinery Co., Long Beach, Cal., has filed plans for a boat shop addition, 50 x 100 ft.

A new electric power station in San Antonio Canyon is planned by the San Antonio Water Co., Ontario, Cal. Glenn D. Smith is manager.

The San Diego & Arizona Railway Co., San Diego, Cal., has made an appropriation for the construction of car and repair shops, engine house and other terminal buildings at San Diego. D. W. Pontius is general manager.

The Liberty Foundry Co., Los Angeles, has filed notice of organization to operate at 3429 South Main Street. Hugh G. Pangborn and W. B. Barnes head the company.

The San Joaquin Light & Power Co., Fresno, Cal., has made application to the State Railroad Commission for permission to issue bonds for $1,000,000 for new electric power plants at the Crane Valley dam and at reservoir No. 1, San Joaquin River. The company also plans development work for a power site on the North fork of the Kings River.

The Southwestern Shipbuilding Co., Los Angeles, recently incorporated, is planning a shipyard at San Pedro Harbor. A site used by the Pacific Wharf & Storage Co. has been selected and preliminary operations are under way. William F. Howard, vice-president of the Western Pipe & Steel Co., San Francisco, and other officials of this company, which maintains a branch at Los Angeles, are interested in the new company.

A. M. Wishart and Alexander Cameron, Yerington, Nev., have made application to the State Water Commission for permission to build a 2500-hp. electric power plant on Sweetwater Creek, Mono County, to cost about $50,000.

Texas

AUSTIN, APRIL 13.

The Odessa Oil Refining Co., Ranger, will construct an oil refinery and build a pipe line to connect producing wells. Pumping plants will also be installed.

The City Council, Pleasanton, has taken over the local electric light plant and will install additional machinery and equipment.

It is announced by the Texas Co., Houston, that it will build an 8-in. pipe line from the Ranger oil field to West Dallas, a distance of about 150 miles.

The Pacific Northwest

SEATTLE, April 8.

Machine shops and foundries in this section are gradually being adapted to take care of more of the auxiliary machinery required in ships under construction, and results have been so gratifying that shipbuilders are depending more and more upon local manufacturers for such equipment. Every plant is rushed with work and many have orders for months ahead.

By-products factories are in immediate prospect and the business associations of large cities are actively co-operating with companies in securing suitable locations. The tremendous amount of logging and sawmill work has resulted in numerous manufacturing projects based upon wood by-products for the utilization of waste products.

The car shortage continues extremely serious, but has been slightly improved in some sections the past week.

The Clearwater Lumber Co., Spokane, Wash., has been incorporated and will immediately begin cutting and preparing for the market 300,000,000 ft. of timber near Kamiah, Idaho. The company will remodel its two sawmills and install additional equipment to increase the daily capacity from 100,000 to 200,000 ft.

It is reported that the Atlantic & Pacific Shipbuilding Co., an Eastern organization, contemplates the construction of a plant in the vicinity of Portland, Ore., for building 150 auxiliary wooden vessels for private interests. It is stated that Lester W. David, of the Monarch Mill, Portland, is identified with the project.

The plant of the Standifer Wooden Shipyards, Vancouver, Wash., was recently damaged by fire with an estimated loss of $30,000.

The Yakima Sash & Box Co., Yakima, Wash., has been incorporated with $15,000 by R. A. Wise, L. E. Ellison, and Henry King.

The Torney Timber Co., Bonners Ferry, Idaho, plans extensive logging and sawmill developments in its properties on Mission Creek. The present sawmill will be moved to a new site and doubled in size. A large amount of new equipment will be purchased.

The Foundation Co., Tacoma, Wash., building ships for the French Government, plans to add 1000 men to its working force of 1400 and to put the plant on a double shift basis.

The Pacific Marine Iron Works, Portland, has Government contracts for the installation of machinery in 16 ships now building in the Portland and Astoria districts. The company is equipping a new fitting-out yard.

The Liberty Foundry Co., Portland, will erect a foundry and machine plant, 50 x 100 ft., to be equipped with new machinery.

The Hesse-Martin Iron Works, Portland, has received contracts for furnishing steering engines for the 8800-ton steel freighters under construction by the Northwest Steel Co. Heretofore this equipment has been purchased from Eastern plants.

The plant of the Northwest Steel Co., Portland, is to undergo repairs costing about $30,000, including new beam shop, and repairs to plate shop recently damaged by fire.

The Skinner & Eddy Shipbuilding Co., Seattle, has contracted with the Electric Boat Co. of New Jersey to construct six submarines for the Government. Work will be rushed.

The Pacific Electric Welder & Mfg. Co., Seattle, has recently installed in its plant at Renton more than $20,000 worth of new equipment. It manufactures electric heaters.

The Risdon Stoker Co., Seattle, recently organized, will establish a plant to manufacture a newly patented stoker.

Canada

TORONTO, April 15.

The Universal Car Co., Ltd., Toronto, has been incorporated with a capital stock of $60,000 by George H. Sedgewick, 36 Toronto Street; James Aitchison, Albert B. Nind, and others, to manufacture automobiles, cars, machinery, motors, tools, etc.

The Toronto Hardware Mfg. Co., Ltd., with a capital stock of $500,000, has been granted a license in Ontario to manufacture hardware, machinery, tools, implements, etc. John H. Ince, 184 University Avenue, Toronto, is representative of the company.

The plant of the Galena Signal Oil Co., West Toronto, was totally destroyed by fire April 6 with a loss to building

and contents of $300,000. It is expected that the plant will be rebuilt without delay.

The Northlight Motor Co., Wesley Building, Toronto, will shortly commence the manufacture of marine engines, etc., and is in the market for a screw cutting lathe, large drill, planer, milling machine, 30-in. band saw, wood-turning lathe and universal wood trimmer.

The Veterinary Specialty Co., Ltd., 1595 Dundas Street West, Toronto, is in the market for a 100-hp. boiler, 75-hp. engine and a 1-ton power elevator.

Milton & Prentiss, Traders Bank Building, Toronto, are in the market for two 250-hp. vertical steam engines.

Bids will soon be received by W. J. Ross, clerk, Sudbury, Ont., for one electric pump of 12,000-gal. capacity and one 175-hp. alternating-current two-phase induction motor direct drive, 220-volt.

Millson & Burgess, architects, Union Bank Building, Ottawa, Ont., have prepared plans for the erection of a machine shop for the Hull Iron & Steel Works, Hull, Que., to cost $30,000.

The Montreal Locomotive Works, Ltd., 145 St. James Street, Montreal, will build an addition to its plant.

The E. Long Mfg. Co., Queen Street, Orillia, Ont., machinery manufacturer, will build a two-story factory to cost about $60,000. W. W. McBain is secretary-treasurer.

J. Stirrett & Sons, 401 Eleventh Avenue, Port Arthur, Ont., contemplate the erection of a sawmill to cost $60,000.

F. Neil Brodie, 42 Princess Street, architect, has been engaged to prepare plans for an addition to the plant of T. McAvity & Sons, Ltd., 13 King Street, St. John, N. B., to cost $500,000.

The St. John Shipbuilding Co., Ltd., St. John, N. B., will shortly commence the erection of a steel shipbuilding plant. Frank D. Chase, Chicago, is engineer.

The Chapman Double Ball Bearing Co., 347 Sorauren Avenue, Toronto, will build an addition to its plant to cost $4,500.

The Unilectric Co. of Canada, Ltd., Edmonton, Alta., has been incorporated with a capital stock of $25,000 by Chester McMann, Joseph R. Ulery, both of Edmonton; Godfrey H. Beaudry, Wainwright, and others, to manufacture electrical supplies, equipment, motors, machinery, etc.

The Forbes Corporation, Ltd., Montreal, has been incorporated with a capital stock of $50,000 by John J. Creelman, Sadi C. Demers, John B. Henderson, and others, to build ships, tugs, etc.

The Tallman Brass & Metal, Ltd., Hamilton, Ont., has been incorporated with a capital stock of $800,000 by Joseph N. and William N. Tallman, and others, to take over the plant and business of the same name.

The Interurban Engineering Co., Ltd., Toronto, has been incorporated with a capital stock of $35,000 by Edwin Smily, 17 Thornburn Avenue; Bruce Williams, Bank of Hamilton Building; Wesley Rhodes, and others, to manufacture machinery, motors, electrical equipment, etc.

Lauder, Spears & Howland, Ltd., Toronto, has been incorporated with a capital stock of $250,000 by William W. Vickers, 77 York Street; Harold Wilson, Robert F. Angus, 325 St. George Street, and others, to manufacture lumber, pulp wood, etc.

The Long & Wilson Hardware Co., Ltd., Walkerville, Ont., has been incorporated with a capital stock of $40,000 by Albert Long, Alfred Miers, both of Walkerville; Herbert W. Wilson, Windsor, and others, to manufacture hardware, machinery, builders' supplies, etc.

The Queen City Dental Manufacturers, Ltd., Toronto, has been incorporated with a capital stock of $40,000 by Frank E. VanDusen, 140 Albany Avenue; Frederick Lane, 42 Curzon Street; Herbert B. E. Scott, and others, to manufacture machines, tools, etc.

The Auto Electric Service Co., Ltd., Toronto, has been incorporated with a capital stock of $40,000 by George J. Beattie, 72 Victoria Street; Ivan R. Church, Rudolph P. Caulford, and others, to manufacture electrical equipment, machinery, etc.

The Pioneer Collapsible Tubes, Ltd., Toronto, has been incorporated with a capital stock of $50,000 by Alfred T. Bonathan, 108 Ashburnham Road; Charles W. Toms, 444 Spadina Avenue; Henry L. Crossland, and others, to manufacture metal tubing, collapsible tubes, etc.

John Price, Ltd., Toronto, has been incorporated with a capital stock of $200,000 by George P. Price, 94 Greenwood Avenue; Charles H. Price, and others, to manufacture brick, terra cotta, drain and sewer pipe, etc.

The Dominion Lamp Co., Ltd., Montreal, has been incorporated with a capital stock of $100,000 by Philip H. Klein, Westmount, Que.; Henry B. Irving, Edson G. Place, and others, to manufacture electrical goods, lamps, motors, engines, etc.

The Trenton Cooperage Mills, Ltd., Trenton, Ont., has been incorporated with a capital stock of $100,000 by Joseph M. Bullen, 44 King Street West; Harold L. Steele, Wendell Osborne, and others, to manufacture boxes and articles in which wood or steel is used.

The Interocean Transportation Co., Ltd., Montreal, has been incorporated with a capital stock of $1,000,000 by Waldo W. Skinner, George G. Hyde, Ronald C. Grant, and others, to build ships, tugs, etc.

The Great West Electric Co., Ltd., Winnipeg, has been incorporated with a capital stock of $300,000 by Sidney T. Smith, William R. Ingram, James N. Hutchison, and others, to generate light, heat and power and to manufacture electrical equipment.

J. J. Parsons, Jarvis, Ont., is in the market for an 8 or 10-hp. gasoline engine.

George B. Meadows Co., Ltd., Toronto, is in the market for a press for sheet metal work, etc.

Emery Massicotte, care Three Rivers Steel Foundry Co., Three Rivers, Que., is in the market for two cutting off machines and a 15-ton horizontal traveling crane of 57-ft. beam.

New bids are being received by the London Art Woodwork Co., Ltd., 51 Nightingale Avenue, London, Ont., for the erection of a factory addition and boiler house to cost $15,000. Joseph Keller, 1245 King Street, is manager.

The Dominion Foundry Supply Co., Montreal, will build an addition to its plant on Ann Street, for which tenders have been received.

The Canada Carbide Co., Ltd., Transmission Street, Shawinigan Falls, Que., will build an addition to its plant to cost $500,000. R. A. Witherspoon is works manager.

J. S. Deschamps, Rossland, B. C., will build a sawmill at Sullivan Creek to cost $50,000.

The Victoria Toy Mfg. Co., Ltd., Victoriaville, Que., will build an addition to its plant to cost $15,000. Paul Tourigny and J. E. Alain are interested.

The Swedish Crucible Steel Co., McDougal Avenue, Windsor, Ont., will build a machine shop to cost $9,000 and make additions to its foundry at a cost of $16,000. New machinery will be required.

The Standard Tube & Fence Co., Drew Street, Woodstock, Ont., will build a two-story addition to its plant to cost $40,000. J. L. Hosack is superintendent.

Scarphing Machine for Steel Ship Plates

As a substitute for air-driven chipping tools for cutting recesses in the plates used in building steel ships, the Skinner & Eddy Corporation, Seattle, Wash., has developed a portable motor-driven machine. In operation the plate is clamped to the main frame of the machine by set screws and the scarf is made by a milling cutter mounted on the end of a vertical shaft, which is driven through a combination of spur and bevel gearing by an electric motor. This cutter is fed into the plate by a handwheel that operates a screw engaging with a nut in the sliding carriage which is guided in the main frame. Adjustments are provided to enable scarfs of varying angles and lengths to be cut. The machine is usually carried by a sling from a small jib crane, the plate being supported on trestles at a convenient height. With this machine it is possible to complete a scarf in 25 min. as compared with 75 min. when the chipping tools were used.

D. J. Carson, president Acme Steel & Malleable Iron Works, Buffalo, has been authorized by the board of directors to place a contract for the erection of an additional building 100 x 175 ft. at the company's plant on the New York Central Railroad at Military Road and Chandler Street, and to purchase necessary furnaces and equipment for the manufacture of electric steel supplementing the company's other products.

The W. J. Crouch Co., steel exporter, has leased for a period of years the fifteenth floor at 68 William Street, corner of Cedar Street, New York, where it will be located on April 29.